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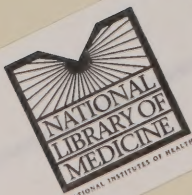
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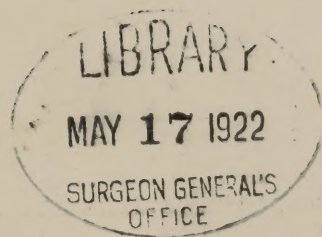
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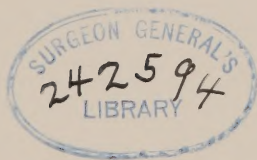
# EDUCATION FOR THE DISABLED IN WAR AND INDUSTRY

ARMY HOSPITAL SCHOOLS: A DEMONSTRATION FOR  
THE EDUCATION OF DISABLED IN INDUSTRY

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TEACHERS COLLEGE, COLUMBIA UNIVERSITY  
CONTRIBUTIONS TO EDUCATION, No. 110



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**Teachers College, Columbia University**  
NEW YORK CITY  
1921



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## PREFACE

IN the world war, United States army hospitals used educational activities on an extensive scale as a new form of treatment for sick and disabled soldiers. The use of school activities for a curative purpose is unique in medicine and in education. Its novelty, the greatness of the occasion, the extent of the experiment, and its importance to education, to the military army, and to the greater industrial army, all demand an accurate record. The army hospital schools, or the educational service as it was called, was but part of the work known officially as the work of physical reconstruction in army hospitals. This monograph will be devoted exclusively to the educational service in United States army hospitals and to only such parts of it as are likely to have a bearing upon public education and upon the reëducation of those disabled in industry.

The statistics and the charts in this monograph are cited from *The Official Medical History of the War*, the volume on Physical Reconstruction, by the author, then Major in the Sanitary Corps. The larger work contains a complete account of the work of physical reconstruction, the splendid achievements in physiotherapy, the organization, administration, detailed statistical tables, and chapters on special topics by eminent contributors.

The statistics were compiled from official reports in the Surgeon General's Office. Miss Mary Carufel, Miss Ruth Pope, and Miss Emily Huger prepared the monthly statistical summaries from which tables of enrollments were compiled. Captain Charles Harlan, Sanitary Corps, and Captain Calvin P. Stone, Sanitary Corps, prepared the longer studies based upon the reconstruction registers and personnel records. Without this assistance and hearty coöperation, it would have been impossible to present the facts in concise and analytic form.

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## CHAPTER I

### PHYSICAL RECONSTRUCTION AND EDUCATIONAL SERVICE

PHYSICAL reconstruction was officially defined as "complete medical and surgical treatment, carried to the point where maximum functional restoration, mental and physical, has been secured. In securing this result, the use of work, mental and manual, will often be required during the convalescent period."

Prior to January 1, 1920, 147,682 sick and wounded soldiers were returned to American hospitals from overseas. Other thousands were received by the hospitals from cantonments over here. These men were given the best medical, surgical, nursing, and sanitary service that science could command. Remarkable indeed were the cures wrought by the army medical department. In addition to these services the educational service provided for the patients happy, useful, curative occupations. The physicians and surgeons said to the school, "These men will profit by a limited amount of activity, suited to their special disabilities, tastes, and requirements." The school filled and administered the prescriptions.

Educational activity was a new curative treatment in medical and army practice, but in reality it is among the oldest curative agencies known to man. In its simplest terms it is work and play. Every human being has experienced the beneficial value of steady employment. Idleness is not conducive to physical or mental health. In the army schools, work and play were capable of a great variety of forms, each suited to the peculiar condition of the patient. Mental and physical activities were combined. The young men in hospitals, many of them undergoing long periods of convalescence, while receiving final medical and surgical treatment, responded wonderfully to the curative benefits of happy, interesting occupation. Physical reconstruction, as a whole, proved of great value in the maintenance of good morale and of discipline itself. There was more in physical reconstruc-

tion than the mere physical. It coördinated the active curative forces of mind and body.

The procedure was simple. All schooling was conducted under medical supervision and direction, though the selection of the immediate educational activity was left to the educational staff. A complete study was made of each individual man; the medical and surgical officers furnished a complete statement of his physical condition, and probable condition upon recovery; the army records gave his army history; the man himself gave an account of his social, educational, and vocational experience. In conference with him, his plans for the future were discussed. Expert educational, vocational advisors then planned hospital school activities which were best calculated to enlist the man's interest and exert the highest curative effect.

The ideals of physical reconstruction marked a new era for men disabled by war. They were considered not as individuals who have become the flotsam upon the tide of war, not as unavoidable wreckage from the strife, but as men still capable of becoming efficient, active, independent units in society. The educational service particularly considered soldiers not as mere physical fighting machines, but as citizens, complete beings. More widespread acceptance of these ideals in military practice and training as well as in military hospitals will do much to humanize the army machine and to make it generally respected in peace as well as in war. Greater recognition of these same ideals in industry, in civil hospitals and other institutions will have a like effect, besides increasing their immediate curative efficiency. If the addition of such educational treatment will restore to society vocationally competent individuals, contented and independent, instead of vocationally helpless, unhappy and dependent individuals, it will be eminently worth while. This has undoubtedly been done for thousands of American soldiers. If it can be done for American men in uniform, it can be done for American civilians.

## CHAPTER II

### FACTORS OF THE PROBLEM

IN any teaching problem the factor of paramount importance is the student. In the army schools the students were young American soldiers. Prior to December 31, 1919, 110,648 men were enrolled in some form of educational service. Chart I (p. 14) shows the subject student enrollment, the total number of individuals enrolled in any month, and the number of new registrants month by month. The striking fact shown by this chart is the exceedingly rapid rise in hospital populations and school enrollments from January to March and the equally rapid decline from April to August. The task was that of providing schooling for 100,000 men in the short space of six months.

The large numbers of men to be provided for were thus an important factor of the problem; the second great factor was the physical condition of the patients. That this should be of primary importance in the hospitals is evident, but there appears no good reason why it is not of equal importance in any educational institution. In the hospital schools educational activities were so conducted as to improve physical condition. In educational institutions physical condition should be maintained in order to achieve educational results. Conservation of health should be included in every curriculum.

Table I shows the prevailing types of disabilities during the months of December, 1918, to April, 1919. The table is not all-inclusive, but contains the data from a large enough number of hospitals to give an idea of the relative distribution of disabilities among the men registered for educational treatment. Of any single disability, pulmonary tuberculosis is in the lead. Orthopedic cases show the larger number, but this includes almost any injury which involves the motion of a joint. The convalescent cases are also large in number, including those recovering from sickness. Cardio-vascular cases are more numerous in December than at any time later, because many of these

cases were undoubtedly detected on this side and taken direct to hospitals from cantonments in the United States.

TABLE I  
TYPES OF CASES REGISTERED FOR EDUCATIONAL WORK

	<i>1918 December</i>	<i>1919 January</i>	<i>February</i>	<i>March</i>	<i>April</i>
Pulmonary Tuberculosis . . . . .	1,610	1,907	1,004	3,139	2,376
Orthopedic . . . . .	1,098	1,758	3,962	5,016	5,228
Cardio-Vascular . . . . .	635	227	340	313	336
Amputation . . . . .	496	644	865	1,125	1,040
Diseases and Wounds . . . . .	323	665	2,338	1,689	1,757
Injury to Nervous System . . . . .	308	384	481	837	1,191
Eye, Ear, Nose and Throat . . . . .	306	318	336	536	671
Functional Neurosis . . . . .	283	169	435	730	773
Insanity . . . . .	112	142	165	636	289
Other General Medical . . . . .	467	419	760	1,326	1,413
Other General Surgical . . . . .	212	445	732	1,567	1,296
Convalescent . . . . .	315	239	1,044	1,610	2,167
Arthritis . . . . .			248	246	225
Nephritis . . . . .			158	199	242
Gassed . . . . .			154	323	391
Gastro-Intestinal . . . . .			106	154	211
Severe Injury—Face and Jaw . . . . .			98	120	236
Venereal Disease or Sequelæ . . . . .			73	68	91
Blindness . . . . .			53	64	101
Skin Disease . . . . .				66	37
Deafness . . . . .				34	49
Neurasthenia . . . . .				32	41

Next to the factor of disability came the consideration of a man's previous schooling. The choice of an educational activity depended very largely upon the man's capacity and previous training. A study of 12,067 records received by the Surgeon General's Office prior to April, 1919, gives the results shown in Table II. Of these men 14.4 per cent had either received no schooling or recorded none. It is probable that with the majority of these unrecorded cases there was no schooling to record. It is probable that these young men represented quite fairly the average which would be found among civilians, 7.7 per cent of whom are illiterate according to the United States Census of 1910. It should also be borne in mind that for all practical purposes





A WARD

The curtains are unusual

Camp Grant, Illinois



TABLE II  
SCHOOLING OF 12,067 PATIENTS REGISTERED IN  
EDUCATIONAL DEPARTMENT<sup>1</sup>

APRIL 30, 1919

	<i>Men</i>	<i>Per Cent</i>
Schooling not recorded.....	466	3.9
Schooling not classified.....	675	5.6
No schooling.....	595	4.9
Total.....	1,736	14.4
ELEMENTARY SCHOOL	Stopped with 1st grade.....	133 1.1
	Stopped with 2nd grade.....	215 1.8
	Stopped with 3rd grade.....	388 3.2
	Stopped with 4th grade.....	705 5.9
	Stopped with 5th grade.....	778 6.4
	Stopped with 6th grade.....	841 7.0
	Stopped with 7th grade.....	1,110 9.2
	Stopped with 8th grade.....	3,067 25.4
Total.....	7,237	60.0
HIGH SCHOOL	Stopped with 1st year.....	855 7.1
	Stopped with 2nd year.....	679 5.6
	Stopped with 3rd year.....	359 3.0
	Stopped with 4th year.....	676 5.6
Total.....	2,569	21.3
COLLEGE	Stopped with 1st year.....	179 1.5
	Stopped with 2nd year.....	158 1.3
	Stopped with 3rd year.....	76 .6
	Stopped with 4th year.....	112 .9
Total.....	525	4.3
GRAND TOTAL.....	12,067	100.0

education which stops with the third grade in school leaves the pupil illiterate, if one considers that literacy should mean ability to readily comprehend written matter. Men who in their youth received third-grade education, however, and have since been of studious habits should be thoroughly literate at the age of these soldiers. It should also be borne in mind that the education of men who enrolled in hospital schools is likely to be higher for the

<sup>1</sup> Facts are taken from physical reconstruction registers received at the Surgeon General's Office.

group than for those who did not enroll in the hospital schools. It is evident, then, that there is a surprising degree of illiteracy. Sixty per cent of 12,000 men attended school, but stopped with the eighth grade, or below. Twenty-one per cent had some high-school training and 4 per cent had attended college.

The following table summarizes reports from four hospitals:

TABLE III  
SCHOOLING OF SOLDIERS IN HOSPITAL SCHOOLS

	<i>No. of Men</i>	<i>No Schooling</i>	<i>Grades I-VI</i>	<i>Grades VII-VIII</i>	<i>Stopped in High School</i>	<i>Stopped in College</i>
Fort Sheridan, Illinois . . . . .	596	1.5%	23.2%	47.0%	22.8%	5.5%
Fort Snelling, Minnesota . . . .	1,332	1.3	29.2	47.7	19.5	2.3
Walter Reed, D. C. . . . .	735	3.6	37.3	36.4	18.8	3.4
Colonia, New Jersey . . . . .	703	13.5	25.5	38.6	18.5	4

In cases of patients whose mentality seemed to warrant, the army psychologist gave special psychological examinations by means of the army intelligence tests. Table IV shows the distribution of scores of 782 patients examined by the Alpha Test at Fort Snelling, Minnesota. It appears from this table that the scores range from 5 to 195, with a mode of 55, and a median at 76. At the same place 548 patients showed mental ages distributed from  $6\frac{1}{2}$  years to over 18 years, with a mode of 13 to 14, and a median at 13.4. A comparison of 555 men registered in the educational department and 465 men not enrolled, showed a higher rating for the men in school. The most noticeable difference was in the percentage of men in the higher groups.

Before programs of work could be selected for the different men, it was necessary to know something of their past vocations and their future plans. Information regarding the man's vocation was secured largely from the man himself. A survey of 1,270 unselected overseas men enrolled in the educational department at Fort Sheridan, Illinois, showed that 509, or 40 per cent, desired a change of vocation. Of this number 135, or  $10\frac{1}{2}$

TABLE IV

DISTRIBUTION OF THE SCORES OF 782 PATIENTS EXAMINED BY ALPHA TEST  
AT UNITED STATES ARMY GENERAL HOSPITAL No. 29, FORT SNELLING,  
MINNESOTA

<i>Scores</i>	<i>No. of Men</i>
1- 10.....	5
11- 20.....	31
21- 30.....	46
31- 40.....	56
41- 50.....	63
51- 60.....	80
61- 70.....	71
71- 80.....	69
81- 90.....	71
91-100.....	62
101-110.....	53
111-120.....	36
121-130.....	42
131-140.....	29
141-150.....	20
151-160.....	29
161-170.....	11
171-180.....	5
181-190.....	2
191-200.....	1
201-212.....	0
Total.....	782

per cent of the total number of men, were uncertain as to the choice of new vocation. The vocations to which the largest number of men were anxious to return were as follows: electricians, 87 per cent; auto repair men, 83 per cent; salesmen, 75 per cent; firemen, 75 per cent; farmers, 75 per cent; carpenters, 61 per cent; machinists, 58 per cent; miners, 55 per cent; students, 51 per cent; office clerks, 46 per cent; laborers, 44 per cent; factory helpers, 43 per cent; auto drivers, 42 per cent. The most popular new vocations were auto repair men, 72; farmers, 35; electricians, 35; office clerks, 30; salesmen, 15.

A survey of 860 men in the tuberculosis hospital at Denver, Colorado, showed that 230, or 26.6 per cent, were farmers; 172 desired to continue farming, and 48 desired to enter it for the first time. There were 56 machinists, 44 of whom desired to remain and 12 new ones desired to enter; 34, or 3 per cent, were

auto mechanics, 10 of whom desired to continue, and 24 new men desired to enter. Vocations which lost heavily in the men's choices were those of factory hands, clerks, laborers, miners, tailors, blacksmiths, and printers. In all, 58 vocations were reported in the survey. The numbers in many of the vocations were too small to be reliable for any generalizations. It is ap-



#### AGRICULTURE

Camp Grant, Illinois

Becoming convinced of the value and simplicity of scientific milk testing

parent, however, that the tendency was toward vocations which promised to be more healthful for tuberculous patients.

The survey of the men at Fort Sheridan showed representatives of 83 vocations, with agriculturists, automobile drivers and repair men, carpenters, electricians, firemen, laborers, machinists, coal miners, clerks, printers, salesmen, and students being the largest groups.

An essential factor in planning work for the men was the length of hospital time available. Thousands of men were re-

turned to this country as hospital patients who were so nearly recovered that all that remained for hospital authorities on this side was to give them final physical examinations and discharge them. It was of little use to start these men on any educational activity. There were others whose time was short, and still others who remained for months. At first it was thought that the period of time available for hospital school instruction would be too short for any respectable progress in education. Had this been the case all the school could have done would have been to furnish temporary diversion. Even this might have been well worth while from the standpoint of curative effects, morale, and discipline.

A study of the reports of 12,067 men sent into the Surgeon General's Office showed that the largest group attended less than ten days; the surprising fact is that the median man had an actual school attendance of 19.5 days. This chart was prepared from reports received during the winter at a time when there was the largest proportion of short-time patients in the hospital. Moreover, the reports for the longest time cases had naturally not been received, as these reports are not forwarded until the men have been discharged from the hospitals. A later study based upon reports received during the summer of 1919 showed for 1,091 men a median attendance of 56 days. It is certain that were the time ascertained for those in the hospital after August, 1919, the median time would be still longer.

From the foregoing discussion it appears that the task was that of providing curative, educational activity for 100,000 men in fifty army hospitals. These men had suffered a great variety of disabilities, had schooling ranging from none to graduation from college, with a median at about the sixth grade. In intelligence rating they did not differ from the other men in the army and were probably higher than the men of like age in civil life. In vocations, both past and future, they represented fairly the industries of the nation. They had periods of time available for hospital study, ranging from a few days to many months, with a median of probably thirty days. This was the student factor in the task.

Other factors to receive immediate attention were the matters of physical equipment, personnel, the rush of the emergency and the accomplishment of the whole task within a military medical



organization. Most of the instructors were ignorant of military or even hospital procedure. Well intentioned efforts often went astray through ignorance of established military channels, procedure, or custom. The machine was big and ponderous. It moved slowly, particularly as it was a new service whose channels and routine had not yet been established. The ideals and methods of the service were new to educators and to the medical staff. To the medical and surgical officers it seemed often like an unwarranted innovation in hospital procedure. Regular army officers who were generally in positions of administrative authority had to be converted to the newer ideals of the service. The educational officers expressed it by saying that it was necessary to "sell the service" to everyone in the hospital.

Physical equipment was difficult to procure on short notice, or through military channels. Seldom was there sufficient room. Fortunately it was possible to use improvised shops and equipment. Work was done outdoors, in basements, in old residences, in quartermasters' shops, in corridors, on porches, and in tents. Gradually, as the congestion decreased, it was possible to secure abandoned hospital wards, which made very satisfactory shops, laboratories, and school rooms.

Never before were teachers with thorough preparation, and the highest grade of scholarship, experience, and personality, so badly needed. Men who were practical, experienced, expert vocational teachers were needed. There are few such in the whole nation. With the armistice all recruiting was stopped, promotions within the army ceased, and the educational service had to find its instructors within an army that was unanimous for discharge. Twenty-five hundred capable instructors had to be found immediately if the service was to benefit the thousands of disabled men streaming through the hospitals.

The task outlined for the educational service was to secure within the army instructors, equipment, and space for shops and school rooms; to organize instruction to fit hospital conditions; to give curative benefit to 100,000 soldiers disabled in many ways, varying in schooling from none to complete college courses, representing in experience and preferences all the vocations of the country, varying in all degrees of intelligence, and possessing limited periods of time in which to achieve any creditable curative and educational results.

## CHAPTER III

### ACHIEVEMENT

THE work achieved in physical reconstruction by the Surgeon General's Office is one of the bright chapters in the history of the world war. Some idea of the difficulties of the task has already been given in the previous chapter. Chart 1 shows the very rapid rise of the educational service and its rapid decline within the short period of a few months. Chart 2 shows the number of hospitals in which educational centers were formally established and operated. The fact that these hospitals were widely scattered from New York to San Francisco and from St. Paul to Sam Houston added much to the difficulties. Much of the direction had to be given through correspondence. It was frequently impossible to secure experienced directors to inaugurate the work in new centers, as there was a constant shortage in personnel. Had it been possible to make preparation before the actual emergency arose, personnel might have been secured and trained, equipment gathered and stored, building space secured; immediate establishment of new centers would then have been comparatively simple and rapid. It will be noted from the chart that at one time there were fifty-two reconstruction centers operating. A few hospitals started operations early in 1918, but at the time of the armistice there were but seventeen hospitals in actual operation. In the main, patients were sent to the hospitals nearest their homes, unless the disabilities were such as to require treatment in hospitals with special equipment.

Table V shows hospital population and men in educational service by months.

The peak of the load was reached in May, with 30,096 men in educational service. The percentage of men in the hospitals in educational service shows a gratifying increase which continued through December, though the peak of the hospital populations was reached in March. In this is unmistakable evidence of the efficient organization of the service and its increased popularity.

TABLE V  
A COMPARISON OF HOSPITAL POPULATION AND MEN IN  
EDUCATIONAL SERVICE

	<i>Hospital Population</i>	<i>Men in Educational Service</i>	<i>Per Cent in Educational Service</i>
January . . . . .	28,023	8,167	29
February . . . . .	63,428	16,296	26
March . . . . .	74,946	24,969	33
April . . . . .	66,640	28,500	43
May . . . . .	62,964	30,096	48
June . . . . .	55,554	26,339	47
July . . . . .	37,546	20,578	55
August . . . . .	30,258	15,944	53
September . . . . .	24,737	14,224	58
October . . . . .	24,112	14,072	58
November . . . . .	22,305	13,598	61
December . . . . .	19,616	11,895	61
Total, 1919 . . . . .	510,129	224,678	44

In March, with 75,000 patients in reconstruction hospitals, there were 33 per cent of them enrolled in educational service, while in December, with 19,616 men, there were 61 per cent enrolled in educational service. At first thought the enrollment in educational service, of less than 50 per cent of the whole number of patients, appears disappointing. There were, however, at all times, large numbers of men in hospitals who were not eligible for educational service, exactly as not all men in hospitals needed the same kind of medical or surgical treatment. The school activity was prescribed for those whom it was expected to benefit. Men likely to be in hospitals less than seven days were not expected to benefit by educational activity. A large number of men in final stages of recovery were received from overseas for hospital examination, and discharged soon after reaching this country. Furloughs were granted very liberally, it being an approved policy to offer furloughs initially to men from overseas, if their physical condition warranted. During the winter months 14 per cent of the patient population was usually absent on furlough. Other patients were in contagious wards, inaccessible to the school service. Officers, as a rule, were not as ready to register in school activities. It is a conservative estimate that

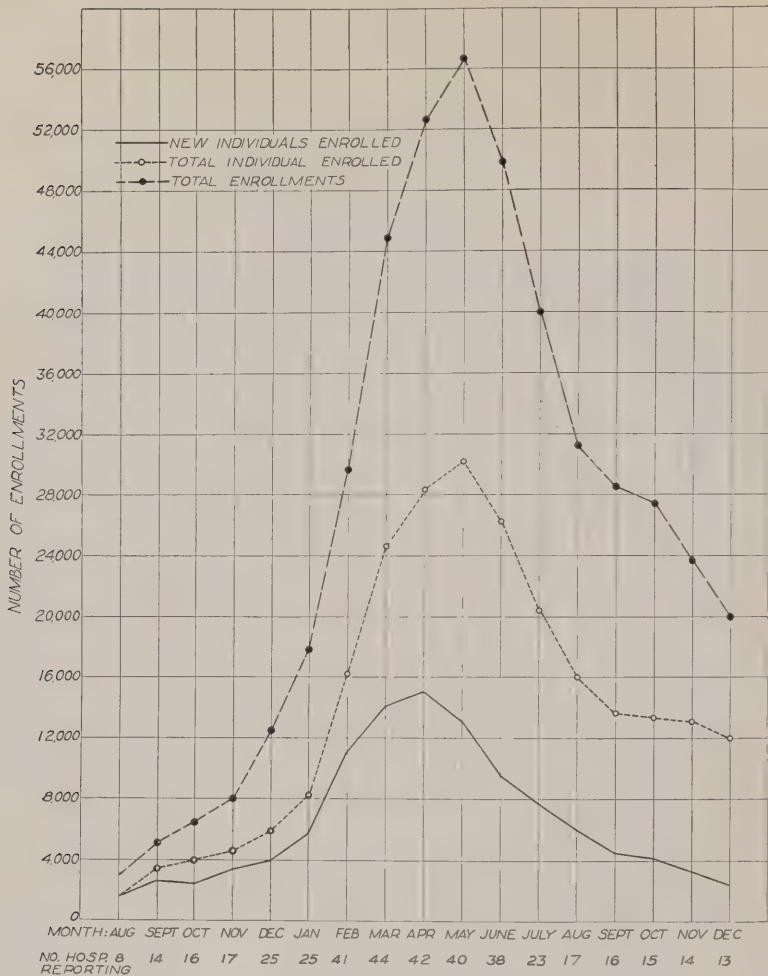


CHART I. Registrants and Enrollment in Army Hospital Schools

35 per cent of the patient population was ineligible. Upon this basis the school reached 63 per cent of the eligible men from January, 1919, to December, 1919. This period includes months when the service was still unorganized. During the latest months of more complete organization, the percentage of patient population enrolled in educational service in many hospitals exceeded 90 per cent.

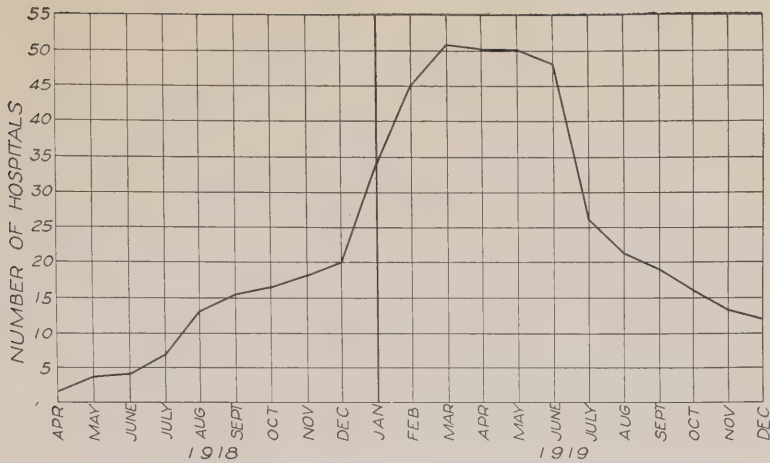


CHART 2. Number of United States Army Hospitals Officially Functioning in Physical Reconstruction, month by month from April, 1918, to October, 1919

Chart 1 also shows the number of individual subject enrollments. The figures upon which this chart is based are given in the table below.

TABLE VI  
ENROLLMENTS IN ARMY HOSPITAL SCHOOLS

1918		March.....	44,917
August.....	3,234	April.....	52,739
September.....	5,217	May.....	56,850
October.....	6,289	June.....	49,798
November.....	7,867	July.....	40,175
December.....	12,757	August.....	31,675
		September.....	28,773
1919		October.....	27,543
January.....	18,172	November.....	23,453
February.....	29,733	December.....	20,821
Total to June 30, 1919.....			287,573
Total to August 31, 1919.....			359,423
Total to December 31, 1919.....			460,013

It is evident that the men were enrolled in more than one subject each. Using these figures it appears that each man on the average was enrolled in three subjects. The months from January to December, 1919, when the organization could reasonably be



expected to be in full operation, showed each man registered in 1.9 courses.

#### PERSONNEL OF THE TEACHING STAFF

The personnel of the teaching staff in various hospitals was recruited from several sources. During the summer of 1918, men were selected from civil life and commissioned direct into educational service. A large number of well-qualified men had been located during the summer and commissions for these were pending at the time of the armistice. All these were annulled and it was necessary to abandon all further induction of men direct from civil life. A few of these men were later engaged on a civilian basis. The next large source of men, after the armistice, was found in the disbanding armies. Canvass was made in demobilization camps and men with promising qualifications desirous of entering the service were found and transferred to educational work. It was a difficult matter to find qualified vocational teachers under these sharply limiting conditions. The army was unanimous for discharge, and even when qualified men were found they did not wish to continue in service. When found, it was necessary that they request transfer to educational service, and that their organizations consent to such transfer. Despite these handicaps many excellent men were found, but only after expensive delays at a time when every minute counted.

The next large group of instructors was a group of women known as reconstruction aides in occupational therapy. These women were recruited freely from groups of experienced teachers throughout the United States. Their qualifications were scrutinized carefully by the central office, and their selection, location, transfer, and discharge remained in the hands of the central office. This free recruiting and complete control of this portion of the educational staff was one of the largest factors making for the wonderful success of these women teachers. Their educational qualifications were high. They possessed special training and almost universally long teaching experience. The facts of their education, special training, and experience are shown in Charts 3, 4, and 5. The qualifications of enlisted men on the educational staff are also shown in the same charts. It is evident that as a group the women had higher general education, more special training and more teaching experience than did the men.

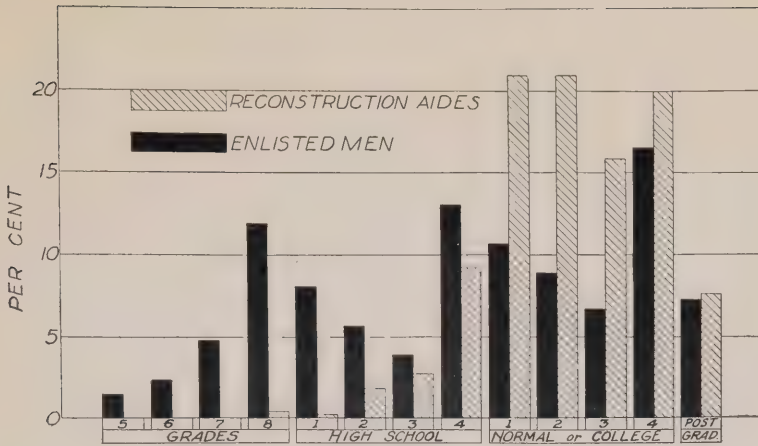


CHART 3. Education of Reconstruction Aides and Enlisted Men, Educational Service

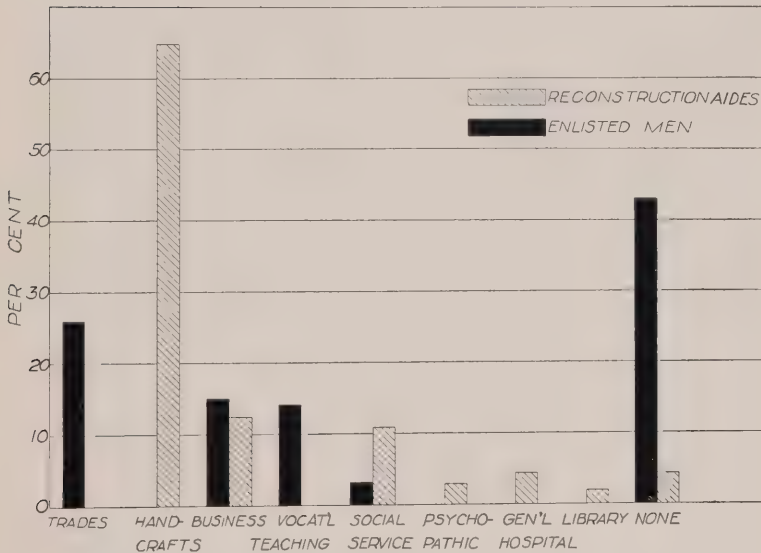


CHART 4. Special Training of Reconstruction Aides and Enlisted Men, Educational Service

The selection of this group of highly qualified women was one of the most notable achievements in reconstruction.

The fact that such a large group of capable instructors was secured at modest salaries demonstrates the possibility for civilian institutions. It must be borne in mind, however, that

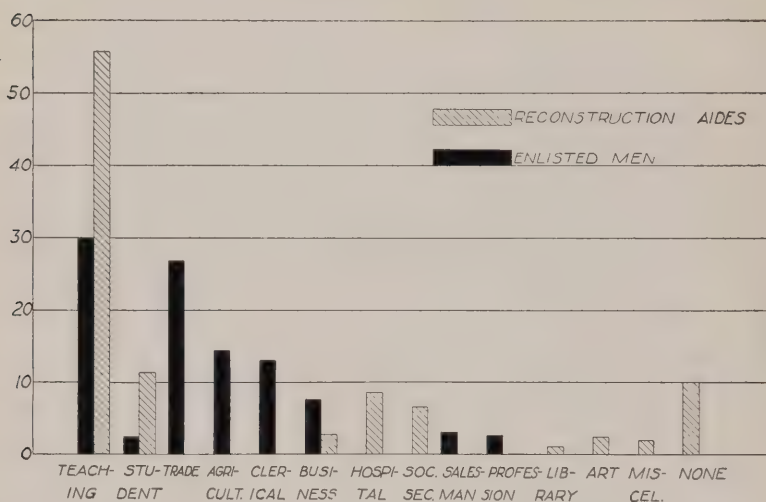


CHART 5. Previous Experience of Reconstruction Aides and Enlisted Men, Educational Service

the patriotic appeal for the war service was strong. Many splendid women accepted war service at financial loss and great personal inconvenience.

Table VII shows the number of instructors in the principal groups month by month.

#### SUBJECTS OF INSTRUCTION

From the educational viewpoint the most astonishing feature of the army hospital schools was the variety of subjects of instruction. The prescription of the medical officers simply called for some form of activity appropriate to the man's physical condition. Naturally the activity likely to be most helpful in promoting recovery was one which presented the greatest interest to the man. Interest stimulated coöperation and effort, caused forgetfulness of troubles and disabilities and promoted a more

TABLE VII  
NUMBER OF INSTRUCTORS IN ARMY HOSPITAL SCHOOLS  
October, 1918, to December, 1919

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Number of Hospitals.....	16	17	25	25	41	44	42	40	38	23	17	16	15	14	13
Commissioned Officers.....	37	43	102	125	210	270	264	252	250	167	127	106	104	87	82
Non-Commissioned Officers and Enlisted Men.....	335	314	695	681	809	888	808	750	603	375	294	207	131	120	103
Reconstruction Aides and Other Civilians.....	124	157	337	449	806	1,163	1,290	1,383	1,288	1,040	943	904	989	982	958
Total on Staff.....	496	514	1,134	1,255	1,825	2,321	2,362	2,385	2,141	1,582	1,364	1,217	1,224	1,189	1,143

helpful and hopeful attitude of mind. The task for the educational department then became this, to find activities suited to the man's physical needs and appealing to his interest. Here it was exceedingly gratifying to find that the apparent conflict between educational values and curative benefits vanished in a majority of cases. During periods of great weakness the physical con-



SPELLING, ENGLISH, AND LETTERING  
East View, New York

Illiterate men learned to read and write English in two hours a day for three months or less

dition sometimes craved and demanded activity that was merely diversional, that was not exacting; mere play, in fact. Occasionally cases were found where the physical disability demanded specific forms of exercise which did not harmonize with the man's personal interest. In the majority of cases, however, the men had reached periods of convalescence and were beginning to think seriously of life after discharge. For all such the probable usefulness of the schooling presented a strong appeal. Vocational and educational values thus intensified the curative benefits because of the strong motive which the man's personal in-



terest gave. The whole field of educational activity was open to the schools. Anything which presented strong appeal to the men and which could be taught was a proper subject for instruction. The men's interests naturally varied through a large range. Availability of instructors and equipment were influencing factors, but as the service became better established it was possible



#### ENGLISH

East View, New York

English is indisputably worth while from any standpoint

to introduce practically all subjects for which there was a reasonable demand. Over one hundred and fifty different vocations or subjects of instruction were presented in various hospitals.

One surprising development was the popularity and efficacy of academic studies. The army experience had made the men realize the necessity of a better command of the common arts of English communication. There is no question as to the usefulness of reading, writing, spelling and calculating. The three "R's" attracted a surprisingly large number of men who were faithful and studious. Thousands learned to read and write, while other

thousands improved their ability along these lines. They began their work in bed and carried it on through convalescence; some even after recovery begged to remain in the hospital. Thousands undoubtedly continued their studies with the Federal Board for Vocational Education.

Table VIII presents more information regarding the subjects of instruction than could be put into a volume of descriptive matter. Bearing in mind the very free selective principles, the table gives an indication of the relative popularity of subjects. It also shows the relative fitness of subjects for instruction under hospital conditions. Some subjects gradually decrease, showing a lessening of demand and probable usefulness of these subjects in hospital schools. Other subjects show steadily increasing popularity. The large groups appear in the academic subjects, typewriting, auto mechanics, crafts, etc.

Each of these large groups consists of a special class of patients. The academic subjects appeal to men with inferior education and to foreigners studying English. Typewriting appeals to men of good education who realize the value of typewriting skill, either as a vocation or for personal convenience. It has an almost universal appeal. Mechanical vocations appeal to young men living in a mechanical age, men whose army experience had been in a war of machinery. They appeal, like typewriting, both to those who expect to follow mechanical pursuits as a vocation and to those who wish a knowledge of machine practices and automobile repair for their personal convenience. Crafts show a large enrollment because crafts were so well suited to the acute cases who were still confined to beds or to the wards. Those interested in the problems of rehabilitation for the disabled in industry will find this table of army experience exceedingly suggestive and helpful.

#### EXTENT OF CURATIVE EFFECTS

Since the whole service was established primarily for curative purposes, it is important that the curative benefits be clearly known and evaluated. To present absolute proof of the curative effects of a form of treatment, which was but part of the total treatment received by a soldier, is very difficult, if not impossible. A soldier under treatment received benefit from surgical service, medical service, nursing service, physiotherapy, and

TABLE VIII  
ENROLLMENT IN EDUCATIONAL SERVICE, JANUARY TO JUNE, 1919

SUBJECT OF INSTRUCTION	JANUARY			FEBRUARY			MARCH			APRIL			MAY			JUNE			TOTAL JAN. TO JUNE, 1919
	Shop	Ward	Total	Shop	Ward	Total	Shop	Ward	Total	Shop	Ward	Total	Shop	Ward	Total	Shop	Ward	Total	
GENERAL (ACADEMIC)																			
Reading	284	87	371	389	168	557	417	322	739	349	307	656	298	590	888	311	523	834	4,045
English	382	153	535	680	199	879	912	336	1,248	1,149	519	1,668	999	595	1,594	606	753	1,359	7,283
English for Foreigners and Beginners	358		358	690		690	1,002		1,002	971		971	1,233		1,233	1,094		1,094	5,348
Spelling	294	53	347	426	85	511	479	223	702	570	199	769	638	375	1,013	448	371	819	4,161
Arithmetic	630	90	720	988	146	1,134	1,413	352	1,765	1,436	402	1,838	1,535	738	2,273	1,187	765	1,952	9,682
Rapid Calculation	16		16	101		101	98		98	73		73	116		116	65		65	471
Penmanship	575	132	707	1,021	173	1,194	1,430	208	1,638	1,586	275	1,861	1,636	361	1,997	1,341	509	1,850	9,247
Higher Mathematics	121	9	130	222	18	240	263	68	331	325	88	413	344	106	460	248	97	345	1,969
Science	30	23	53	48	17	65	38	5	63	73	5	78	69	14	83	48	30	79	364
History	9	11	20	73	9	84	30		30	47	23	70	26	28	54	33	23	56	308
Civil Service	88	16	104	112	47	159	172	2	174	133	24	157	126	31	157	163	30	193	884
French	22	5	27	63	8	71	88	43	131	106	40	189	165	13	206	101	116	206	801
Geography				7		7	49	3	52	76	7	100	100	77	2	79	91	4	316
Music		114	114				45	81	45	32	2	54	53		53	362	71	433	728
Brain Reading and Speech (Oral)	48		48	36		36													125
Lip Reading and Speech (Oral)	90		90	63		63	111		111	133		133	140		140	95		95	504
Italian					1	1		6	6		1	1					3		8
Spanish				6	18	24		1	1										29
General	57	4	61	101		101	157	51	208	165	87	252	244	127	371	219	203	422	1,415
Other Courses							319		319	183		183	224		224	33		33	879
Unclassified	40	33	73	257	107	364	158	352	521	426	95	521	386	231	386	231	227	458	1,960
		2	2	3		3													357
Total	3,044	732	3,776	5,285	999	6,284	7,201	2,053	9,254	7,815	2,225	10,040	8,249	3,192	11,441	6,597	3,716	10,313	50,869

TABLE VIII — Continued

SUBJECT OF INSTRUCTION	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		TOTAL JAN. TO JUNE, 1919
	Shop	Ward	Shop	Ward	Shop	Ward	Shop	Ward	Shop	Ward	Shop	Ward	
TECHNICAL A.—SHOPS, TRADES													
Auto Driving .....	18	18	25	67	67	333	333	333	163	163	311	311	917
Auto Repairs .....	462	462	708	1,166	1,166	581	581	581	680	680	478	478	4,075
Auto Mechanics .....	339	6	650	1,149	1,149	1,975	1,975	1,975	2,238	2,238	1,918	1,918	8,275
Blacksmithing .....	10	10	7	14	14	7	7	7	7	7	14	14	59
Concrete Working .....	183	183	213	414	414	555	555	555	555	555	556	556	2,476
Electrical .....	18	18	213	414	414	555	555	555	555	555	556	556	2,476
General Mechanics .....	67	67	98	149	149	229	229	229	311	311	254	254	1,108
Machinery .....	10	10	27	56	56	137	137	137	233	233	172	172	42
Plumbing and Pipe Fitting .....	18	18	27	56	56	137	137	137	233	233	172	172	42
Radio Operating .....	2	2	34	56	56	137	137	137	233	233	172	172	42
Radio Electricity .....	2	2	34	56	56	137	137	137	233	233	172	172	42
Telegraphy .....	258	258	317	448	448	506	506	506	480	480	397	397	1,919
Sheet Metal Work .....	16	2	4	12	12	47	47	47	522	522	397	397	2,594
Vulcanizing .....	37	37	47	65	65	104	104	104	87	87	86	86	325
Welding .....	18	18	14	99	99	48	48	48	109	109	103	103	440
Painting .....	15	15	35	41	41	50	50	50	46	46	13	13	200
Cartooning .....	32	32	51	60	60	69	69	69	85	85	75	75	401
Shoe Repairing .....	60	60	107	145	145	111	111	111	111	111	108	108	642
Sign Painting .....	5	5	5	22	22	39	39	39	33	33	19	19	113
Tailoring .....	46	46	30	61	61	108	108	108	106	106	62	62	503
Motion Picture Operation .....	29	29	9	4	4	1	1	1	5	5	180	180	19
Trunk Making .....	365	69	470	85	85	21	21	21	26	26	112	112	465
Applied Arts .....	37	37	44	94	94	126	126	126	103	103	49	49	69
Cable Splicing .....	37	37	44	94	94	126	126	126	103	103	49	49	69
Drafting .....	39	2,352	32	3,612	4,786	4,835	90	8,509	9,507	9,601	96	8,145	4,832
Printing .....	137	137	127	221	221	199	199	199	196	196	121	121	819
Work with Textiles .....	159	159	245	303	303	343	343	343	262	262	241	241	1,001
Carpeting (Rough) .....	80	80	380	401	401	404	404	404	415	415	269	269	1,553
Woodworking .....	17	17	1	3	3	3	3	3	6	6	5	5	309
Cabinet Work .....	80	80	380	401	401	404	404	404	415	415	269	269	1,553
Bench Woodworking .....	17	17	1	3	3	3	3	3	6	6	5	5	309
Furniture Repairing .....	58	841	899	1,808	2,439	2,581	201	2,588	2,789	2,884	183	2,144	13,228
Woodworking (Carving, etc.) .....	797	797	32	1,555	1,587	83	3,831	3,914	4,169	4,240	6	4,185	17,398
Reed, Cane and Fiber Work .....	145	145	281	282	282	257	257	257	372	372	379	379	1,720
Work in Applied Pattern .....	39	489	528	65	1,124	1,189	82	2,363	2,445	2,445	184	626	6,688
Metal Work .....	13	374	387	22	651	673	28	1,233	1,261	1,261	60	1,717	8,325
Leather, Cardboard and Bind- ing .....	40	298	338	99	362	461	177	446	623	173	1346	146	3,331
Work in Plastic Materials .....	27	27	81	652	733	361	1,650	2,011	571	571	182	259	4,888
Miscellaneous .....	2,651	5,338	7,992	4,076	10,139	14,215	7,018	16,051	23,069	8,467	20,860	7,183	18,502
Total .....	2,651	5,338	7,992	4,076	10,139	14,215	7,018	16,051	23,069	8,467	20,860	7,183	18,502

[illegible]



educational service. He might be under the treatment of all these agencies at one time. He improved and reached a final state of recovery. To determine which service cured him is impossible. It is probable that all contributed.

The proof of the curative value of occupational therapy will have to rest upon the accumulation of opinion, the general trend of improvement and occasional individual cases where combination of circumstances made possible the isolation of curative workshop treatment. If there can be shown decided adaptations of curative work to specific injuries; if it can be shown that among thousands of men there appears a decided selection of



CLAY MODELING FOR DROP WRISTS  
Cape May, New Jersey

One of the first exercises to stimulate return of muscular control in these cases

occupational activity for curative purposes and coincident with this treatment there was rapid improvement; if, in special cases, a direct connection can be shown between curative activity and improvement; and if there can be shown a preponderance of opinion in favor of the benefits of curative work, the inference will be strong in favor of the efficacy of work as a curative agent. It is believed that a candid examination of the evidence will demonstrate the truth of these hypotheses.

Curative work has been of two kinds, specific and general. Specific curative work is work prescribed to exert a direct, immediate curative effect upon the disability. Typewriting is a specific exercise for stiffened fingers. Exercise upon foot-power treadle machines in wood shop exerts direct effects upon leg, foot and ankle disabilities. Graduated physical exercises are cal-

culated and devised to exert direct specific effect upon heart cases. Nearly every craft taught in the hospitals can show many ingenious adaptations devised to exert direct curative influence upon some disability.

To describe many individual cases which illustrate both specific and general effects will be impossible in this brief treatment. The complete history contains accounts of many individual cases showing both direct and general effects obtained by the use of a large variety of activities. The wood shop has been



A TOY SHOP  
Cape May, New Jersey

an especially valuable field for specific curative exercises in injuries affecting the joints. Planing, sawing, and hammering are useful for the joints of the arms and hands. Foot-power machines of all sorts afford excellent exercise for joints of the legs and feet. For finger exercises wood carving, typewriting, basketry, telegraphy, rug making, drawing, violin playing, painting, sewing, gardening, leather work, weaving, etc., have all been very successful, and allow of sufficient variation to make possible a selection of activities suited to special needs.

General curative work is work calculated to improve physical or mental tone and thereby enhance the chances of rapid and complete recovery. For many disabilities it is impossible to de-

vise a specific curative exercise. The problem then becomes one of providing work which will exert beneficial influence upon mental and physical tone. A large part of the occupational therapy will belong in this class though attention has largely been centered upon the more direct specific exercises.

In psychiatric cases it is very evident that the work is likely to exert a general influence. In fact, so obscure may be the mental difficulty that to touch it with specific remedy is impossible.



SHOE REPAIRING AS A NEW VOCATION FOR AN AMPUTATION CASE



PLANING FOR INJURED ARM, A DIRECT CURATIVE EXERCISE

Many patient, special, repeated appeals with all sorts of approaches and activities may have to be made before a line is found which seems to penetrate the murkiness of mental obscurity. At last something stimulates an intelligent reaction. That line is then followed and the steady improvement is wonderful and gratifying. It matters not what activity may be provided if it furnishes the avenue of communication. Weaving, bead-chain work, music, scrap books, games, gardening, work with colors, typewriting, conversation, any occupation is welcome and oftentimes the thing which proves efficacious appears to be a most surprising selection.

An amputation case receiving treatment and waiting for final hardening of the stump and fitting of prosthesis cannot receive much direct curative benefit for the disability, because there is

little to be done outside of a small amount of exercise and final training in the use of the artificial appliance. A good general physical condition, however, is very essential, and a well-sustained morale quite as much so.

In the larger field of general effects all forms of activity have had their application, different kinds appealing to different men. Particularly good have been the prescribed physical exercises, recreation and play for heart patients, for the tubercular, for the



WEAVING LINEN HANDBAG  
Camp Custer, Michigan

A most engaging occupation. The attention of the patient is entirely diverted from his ills

psychopathic cases and for all those whose physical tone during convalescence needed rebuilding.

Bedridden cases present a most fruitful field for the application of general curative activity, but often small opportunity for specific work. Here the pain and monotony, with the accompanying despondency and impatience are all alleviated by having some happy occupation. Properly selected, such occupation arouses interest, brings momentary forgetfulness of the difficulty, arouses willingness to make an effort and results in a healthy, wholesome fatigue, all of which improves bodily tone and gives nature's curative forces a freer opportunity.



**BASKET MAKING**

Ft. McHenry, Baltimore

A curative craft and suited to great variation in conditions and patients

**DRAWING AND CARTOONING**

Ft. McHenry, Baltimore

An art adapted to many conditions and leading on to many vocations



Out of hospital conditions grew a new department of educational activity directly in line with the curative purpose of the school. It was a department devoted to the measurement of the extent of motion and function in case of weakened muscles or impaired joints. Very ingenious measuring apparatus was devised. Frequent measurements were taken of the patients and recorded graphically on charts, showing at a glance the ups and downs of recovery. This measurement was called metro-



METRO-THERAPY, MEASURING ELBOW MOTION  
Walter Reed Hospital, Washington, D. C.

therapy. It informed the medical officers and instructors regarding the man's progress and the efficacy of treatment. It afforded encouragement to the man and stimulated interest in his own case. It improved mental attitude and encouraged co-operation and effort. Thousands of these measurements were taken. Chart 6 shows the record of one soldier whose recovery of function in elbow and wrist coincided with the work taken in typewriting and woodwork. At times the curve of progress showed abrupt decline or plateaus of no improvement which

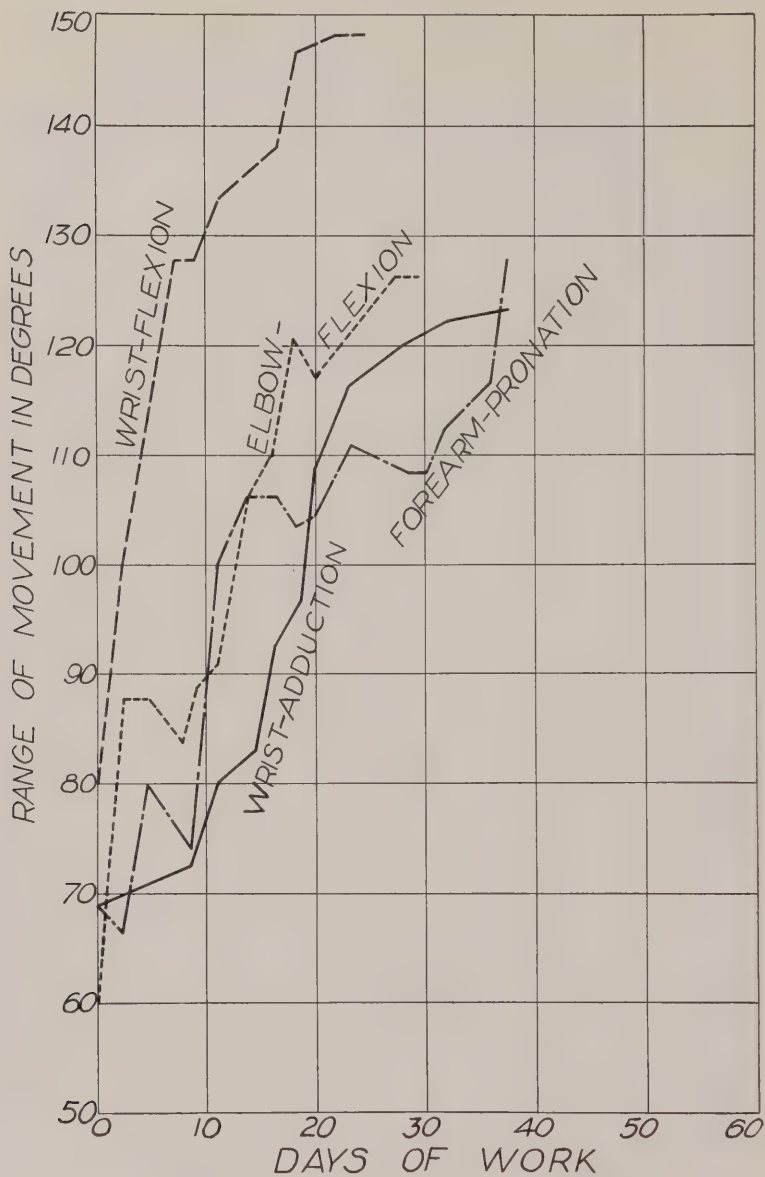


CHART 6. Curative Workshop Improvement Chart

coincided quite closely with furloughs and with absence from class or workshop. Though in these cases it is not possible to credit all the improvement to the curative activity, yet the coincidence of improvement with activity in thousands of cases creates a strong inference that the activity was helpful and promoted improvement.

Accurate records were kept with one group of patients at General Hospital No. 3, Colonia, New Jersey, in which the direct benefit of wood shop activity is clearly evident. A group of forty patients who were enrolled in the wood shop for curative exercises were also measured regularly in the metro-therapy laboratory. Accurate records of attendance upon the curative workshop were kept. After one month's time, from March 15 to April 14, 1919, the men were ranked in accordance with attendance upon the wood shop work and in accordance with the per cent of improvement in motion and strength as shown by the metro-therapy. One-half hour of work was adopted as a unit of measurement for attendance. The per cent of improvement was reckoned as the ratio between actual improvement and the amount of improvement possible if the patient regained normal power. The attendance at the wood shop per patient during the month varied from one-half hour to forty-four hours. Improvement varied from 2 to 100 per cent. The average attendance was 12.1 hours and the average improvement was 25.6 per cent. Of the fifteen men who attended shop for a number of hours greater than the average, eleven or 73.3 per cent showed greater improvement than the average. Of the twenty-five men who attended shop for a number of hours less than the average, nineteen or 75 per cent showed less improvement than the average.

In other words, over 70 per cent of the men that were most faithful in their attendance upon wood shop activities were the same men who made the greatest improvement. This appears to be a clear demonstration of the positive curative effect of wood shop work in promoting the return of joint movement. The more rapid recovery of function justifies the contention made for educational service,—that it shortens the time of recovery and hence is desirable both for the man and financially for the government.

Were it possible to carry the experiments farther it is probable

that a considerable percentage of men would be found who might never attain full functional restoration, if use of the disabled members were delayed until after discharge from the hospital. The early exercise of the disabled members before the joints and connective tissues may have set, and before the patient has established compensating habits, allowing the idleness of the injured member, promotes possibilities of ultimate recovery.

Another evidence of curative values of educational activity is shown by a study of subject enrollments. Selection of activities was very free, as has already been noted. The question then arises, were the enrollments actually made on the basis of curative values, or were they made to meet other preferences? A careful study of 4,645 cases selected from approximately twenty hospitals, with the cases grouped according to disability, shows in every case the largest groups appearing in the activity which is most likely to be curative. For example, lung cases may include pulmonary tuberculosis, empyema and gas cases. The pulmonary tuberculosis cases may be bed cases, semi-ambulatory, or ambulatory cases. Of 748 lung cases we find 161 men in handicrafts, 69 in academic subjects, 55 in commercial branches, or 285 who are probably bed cases in pulmonary tuberculosis. We find 96 in auto mechanics, 19 in wood shop, 103 in agriculture, 39 in gymnastics, 37 in prescribed walks, making 294 representing the ambulatory patients who have sought open-air activities. The 62 in typewriting and the 22 in radio and telegraphy may very probably be men in the semi-ambulatory class.

Of 178 heart cases the largest group was in gymnastics and light crafts. The group in gymnastics includes men for whom graduated exercise was prescribed as curative treatment. The 26 cases in crafts undoubtedly represent those for whom light occupation was valuable.

Of 521 leg amputation and 114 arm amputation cases, we find the largest groups in commercial and academic subjects, indicating that here the problem was more largely that of vocational readjustment than curative benefit. These disabilities are such as to be most likely to require the selection of a new occupation, or to force the man to make better mental preparation to compensate for physical handicap.

Among the cases of injuries to hip, back, thigh, knee, leg, ankle, or foot, which might all be classified as orthopedic cases in

the lower limbs, are found the largest groups in auto mechanics, wood shop, crafts, typewriting, and academic subjects. The auto mechanics and wood shop afford the greatest variety of curative exercises for such disabilities. Typewriting is valuable for fingers and wrists. Academic subjects probably show selection for vocational values rather than for curative. The crafts group undoubtedly represents the bed cases, men who are undergoing a series of operations and need crafts for the purpose of diversion, which is a form of curative treatment.



ENGLISH, ARITHMETIC, PENMANSHIP  
Colonia, New York

Veterans of Verdun and Cantigny, one with loss of right leg, the other  
with ankylosis of left knee joint

Of 458 mental cases we find 156 in light crafts, 34 in auto mechanics, 43 in wood shop, 41 in typewriting, 35 in agriculture, 69 in academic studies. It is impossible in this group to determine accurately whether these activities were selected for curative value, but the large groups all occur where one would expect them to be for curative purpose. Crafts of all sorts have proved exceedingly valuable in many cases. Typewriting and academic subjects have been found to have a very great value. The



wood shop, mechanics and agriculture have demonstrated their curative value in civil institutions.

An examination of the figures for several hundred cases of injury to shoulder, upper arm, elbow, lower arm, wrist, and hand, shows results similar to those for the orthopedic cases for the lower extremities.

Though it is difficult to prove the exact amount of curative benefit derived from any single form of treatment, yet the educational activities show that:

*a.* Ingenious adaptations of activities, machinery and projects have been devised to give direct curative effect in many disabilities.

*b.* Apparatus and methods have been devised to measure accurately progress in regaining strength and function of joints and muscles, and these measurements show improvement coincident with workshop activities.

*c.* Individual typical cases show increase in rate of recovery, improvement in mental condition and in physical tone coincident with educational and workshop activities.

*d.* A survey of the records of thousands of cases shows large groups of cases in the activities best calculated to give curative benefits.

No survey of the achievements in occupational therapy would be complete without calling attention to its vocational and educational values. Previous discussion has shown that there resulted great curative benefits from educational activities. The dependence of the curative value upon the strength of the appeal was one of the strongest guiding principles in the selection of occupation. There was little need of discussing the competing claims of curative and useful values. The usefulness to the patient of the thing taught by the activity intensified its appeal and its curative value. If rehabilitation were the term to be applied to education that made for vocational readjustment, and occupational therapy were defined as the activity given primarily for curative purpose, then it could be said that rehabilitation activities often were the best occupational therapy activities. Both occupational therapy and rehabilitation can be considered as two viewpoints of the same process. In occupational therapy the primary purpose is curative; in rehabilitation, it is vocational readjustment.

In case, however, of men still in periods of weakness or fatigue, the strongest appeal was frequently the diversional, something which afforded relief from serious thought, which demanded little concentration and presented no exacting standards. As such men advanced into the stage of convalescence, diversional activities lost their appeal, or if continued were continued with serious danger of hospitalization. For a strong man to continue in trivial activities during the final period of his stay in the hospital, when he might have been making more serious efforts to prepare himself mentally and physically for the resumption of serious duties after discharge was unwise.

The ideal series of activities would start with some trivial non-exacting diversional project and lead on through a series of increasingly purposeful activities until the period just previous to discharge, when the man's thought and attention would be centered upon something of real use and application to him after discharge. The leading-on appeal of each succeeding project to one more purposeful and useful was a factor of extreme importance in the selection of suitable activity.

#### EDUCATIONAL BENEFITS

As noted in Table VIII (p. 23) the range of subjects of instruction was very great, owing to the very free selection which was allowed. The table also shows the large extent of the work, amounting between January and December to 460,013 student subject enrollments. The question naturally arises, would these lead to real educational, vocational progress? Undoubtedly a large number of the enrollments in this table represented men who continued but for a short time, or whose attention to the instruction was not sufficient to give them much benefit beyond diversion. Others could have received no more than a start. Such start, however, is supremely important. The best possible service to thousands of men was the inspiration for better educational and vocational preparation. European experience proved that if vocational rehabilitation through education were left until after the men were discharged from the army, only 10 per cent of them were willing to undertake it, while of those who started such work while in hospitals, 80 per cent continued the work after discharge. Frequently it was a discovery to the man to find that he could learn readily in school things interesting and useful to

him. Such a discovery might come in a very short hospital course, a course too brief for any considerable accomplishment, but of exceedingly real benefit. "Well begun is half done." Particularly is this applicable when it is understood that the selection of activities was made carefully by the vocational counselors, after thorough consideration of each individual. A short course might be not only the means of disclosing to the

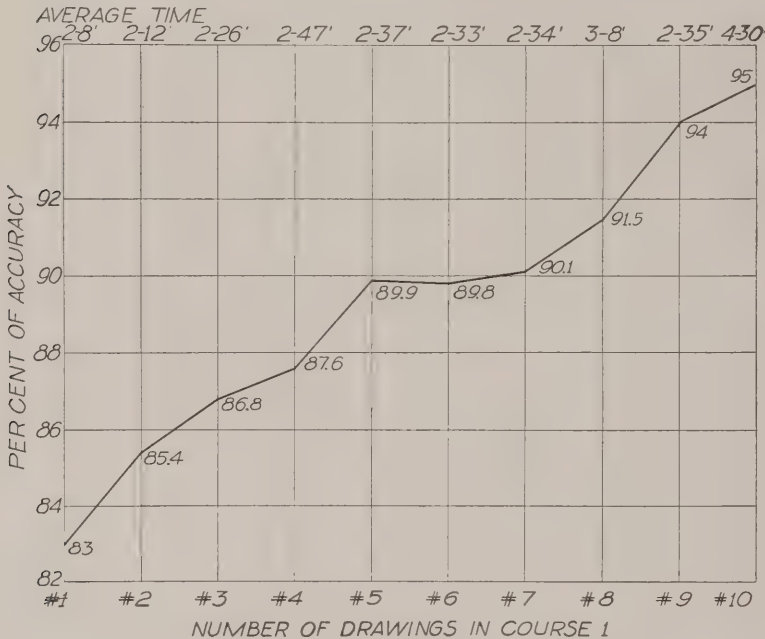


CHART 7. Progress of Forty Men in Unit Course in Drafting

man the possibilities in school preparation, but might also reveal to him interesting fields of endeavor for which he had special aptitudes hitherto unknown to him.

Thousands of men, however, pursued courses of instruction for sufficient length of time to make considerable and creditable educational and vocational progress. Chart 7 shows the experience of forty men with the unit course in drafting. In ten lessons averaging about two hours and three-quarters in length, the growth in accuracy, neatness, and quality of drawing is rapid and uniform. The final drawings show an understanding of the

principles of machine drafting that is surprising when it is considered that it was secured with less than thirty hours of practice and instruction.

Chart 8 gives the experience of forty-five men in typewriting at Camp Dix. The class shows steady improvement in the number of strokes per minute and the percentage of accuracy during



COMMERCIAL ART, SIGN WRITING, AND MECHANICAL DRAWING  
East View, New York

All are practical vocational courses requiring simple equipment and adapted to convalescent patients. All present many "leads."

fifty hours of work. One hundred twenty-one strokes per minute is about twenty words of the length found in average correspondence, and is more rapid than ordinary longhand. When it is considered that these men had learned the correct fingering for touch typewriting and were already started on the right road to become competent typists, it is evident that it was no mean accomplishment to have been secured in fifty hours. Many men became sufficiently expert as vulcanizers, telegraphers, auto mechanics, typists, welders, accountants, and in

other lines of work to be able to secure and hold good commercial positions immediately upon discharge from the hospital.

The achievements in academic subjects were especially pleasing. Table VIII shows 39,766 enrollments in reading, writing, spelling, English and arithmetic; the common arts of English communication. Thousands of men during their hospital stay learned to read and write English. The letters which they write

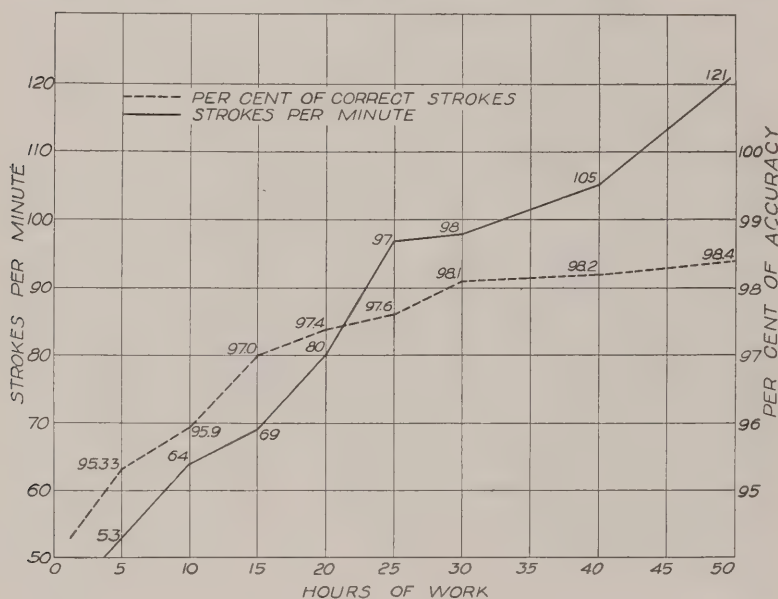


CHART 8. Progress of Forty-five Men in Typewriting

back to their instructors are delightful evidence of the educational and vocational value of this instruction. Two hours a day for two months will teach a man to read and write simple English. Two hours a day for three months, or a total of fifty hours of instruction, will teach a man of average ability and faithfulness to read and write English equal to third grade achievement in the public schools. With the thousands enrolled in these subjects, with the median time of men in hospital schools at least thirty days, it is plain that much educational value was achieved in the academic branches.

Any review of the work done in reconstruction in army hos-



pitals is incomplete without some mention of the wonderful help rendered by volunteer coöperating agencies, such as the American Red Cross, the Y. M. C. A., the Knights of Columbus, the Jewish Welfare Board, and the American Library Association. In addition to these great organizations innumerable smaller local agencies and individuals gave invaluable assistance. These friends assisted in the entertainment of the patients, furnishing



LEFT-HANDED PENMANSHIP  
Walter Reed Hospital, Washington,  
D. C.



LEFT-HANDED TYPEWRITING  
Walter Reed Hospital, Washington,  
D. C.

pictures, theatrical entertainments, music, excursions, automobile rides, flowers, books, magazines and papers of all kinds. When the hospital service in any line was in need of special materials or additional funds, these agencies or interested friends often helped generously. Hundreds of thousands of dollars given in trust by the American people to these organizations were dispensed wisely and liberally. They represented the great heart of America. Their efforts humanized the great military machine. They were big brothers to the boys.

The Red Cross work was coördinated very closely with that of

the government through the hearty coöperation of the national officers. The department of military relief was thoroughly organized and always ready to respond to requests and suggestions from the army officials.

The American Library Association donated thousands of the finest books, entertaining and instructive. Best of all it provided trained librarians who made all books and periodicals from



A TYPICAL WARD WITH THE A. L. A.

Librarian on her rounds. Note the book cart in the foreground. The librarians and libraries furnished by the A. L. A. were wonderfully helpful

all sources available for ready use. Often the librarian organized all the books of the Post into a fine large library that would have done credit to a small city. Regular systems of call-cards for the use of the patients and hospital employees were instituted. The librarians made frequent trips throughout the hospital delivering reading matter as requested, and even carrying attractive sample libraries about for the boys' convenience in selecting books. The photograph gives a view of a ward and the librarian with her cartload of books and papers.

The record of achievement of the army hospital school is a brilliant one. In a short period of time, under rush conditions, in a new field, the Surgeon General succeeded in establishing fifty hospital schools, with 2,500 instructors, with equipment for giving instruction in 150 different occupations, and gave instruction to 100,000 men. These men received great curative benefits in direct curative exercise, in improved mental condition, and in improved morale, resulting from happy occupation. They were introduced to possibilities of improved vocational preparation, often discovering aptitudes and abilities of which they were unaware, encouraging them to vocational and educational preparation after their discharge. Thousands of them improved their educational vocational qualifications so that upon discharge from hospitals they were able to resume profitable employment, often better than they had received before entering the army. Thousands acquired either better command of the common arts of English communication, or for the first time learned to read and write. Surely it is a worthy record of splendid achievement.

The complete history contains numerous accounts of individual cases, showing the application of curative work to different forms and types of disabilities. It will be impracticable to include many of them in this brief account. A few, however, showing the application to a variety of types and serving to illustrate the application of curative educational activity will be found in the Appendix. The individual accounts include cases of mental disability, illiteracy, nerve injury, amputation, tuberculosis and reëducation. They show how curative work accelerates recovery, improves morale, reduces restlessness, promotes contentment, and makes possible proper treatment. They also show substantial educational and vocational gains.

## CHAPTER IV

### ORGANIZATION AND ADMINISTRATION

ONLY items in organization and administration which are likely to be of interest to educational institutions and for those interested in rehabilitation of the disabled in industry will be given in this monograph. The account of physical reconstruction in the official medical history gives in detail the basic authorizations of the War Department and the organization of the work from the Surgeon General's Office and in the local hospitals. Those interested in the army administration will find the documents quoted and the administrative details valuable. They will present less interest for civilian agencies.

The work was officially centered in the Surgeon General's Office. Its organization was a gradual development, as required in a new enterprise. At first the work was under the Special Hospitals and Physical Reconstruction Division in the Surgeon General's Office. The first work done in the field was done under the direction of the orthopedic surgeons. Gradually the work of physical reconstruction became differentiated from the other lines and finally came to include the sections of Physiotherapy, Educational Service, and the work in Convalescent Centers.

Late in 1917 and early in 1918 much time was devoted to investigations of work done by other countries and by civilian agencies, to surveys of the field, and to preparation of plans for the work in America. This work was very helpful when the final emergency arrived. Work was started in several army hospitals in 1918, which was invaluable as pioneer, experimental work. In August, 1918, authorization by the War Department was formally published in the *Official Bulletin*. This authorization designated fifteen general hospitals as centers of physical reconstruction. It stated the purpose of physical reconstruction to be functional restoration. It classified disabled soldiers into three general classes: (a) those who can be restored to full duty,

(b) those who can be fitted for limited military service, (c) those disabled to extent of unfitting them for further military service.

The order commended coöperation, for the rehabilitation service, with the Federal Board for Vocational Education and, for soldiers to be returned to military duty, coöperation with the Committee on Education and Special Training. The possibilities of restoring men already trained in military procedure to limited army service and thus releasing men capable of full military service was one of the attractive purposes of physical reconstruction. It was a service easily recognized as valuable by military and civilian authorities.

With the rush of wounded from overseas it was found wise to extend the physical reconstruction service to base hospitals located in the cantonments. The authority for this was granted by orders from the War Department on December 10, 1918. It was upon this authorization that Convalescent Centers were established in demobilization camps. It was the policy of these centers to take men who were nearly ready for discharge and by a series of physical exercises and some curative work to harden them and bring them to proper physical condition for discharge.

The organization of the central office provided for a chief of the division, the first one being Major Edgar King, M.C., chief of the Division of Special Hospitals for Physical Reconstruction. In March, 1918, the division became known as the Division of Physical Reconstruction and was placed in charge of Colonel Frank Billings, M.C., who remained in charge until June 30, 1919, when the Division of Physical Reconstruction was merged with the Division of Hospitals under the direction of Colonel Henry A. Shaw, M.C. The success of the work is due in large part to the excellent leadership and untiring efforts of these chiefs. Colonel Billings, in recognition of his splendid service, was awarded the distinguished service medal.

Within the division there were established sections of Physiotherapy, Convalescent Centers, and Education. Special officers were detailed to the supervision of the work for the blind, for the deaf and for those with speech defects. Another group of officers, whose service was indispensable, and who contributed greatly to the success of the whole enterprise, was known as the consultants. These were medical officers, inspecting the



work in the hospitals, carrying instructions and assisting the field officers in organizing and directing the work. The official history gives complete roster of all officers connected with the section, including sixty-one officers. Major F. B. Granger, M.C., was director of the section of Physiotherapy, Lieut.-Col. H. E. Mock, M.C., director of Convalescent Centers. The position of director of Educational Service was held successively by Dean James E. Russell, Dean Lotus D. Coffman, Major A. G. Crane, S.C., and Capt. L. H. Van Houten, S.C.

The organization of the office was simple and varied from time to time with changes in the work. At different times there were in the educational section officers for personnel, officers for property, officers in statistical department and psychological service. Majors A. C. Monahan, M. W. Murray, M. E. Haggerty, and Franklin W. Johnson were especially helpful and valuable in the educational section. All of them rendered splendid service, particularly in the period of organization and establishment of the service. Dr. Eleanor R. Wembridge had chief responsibility for the selection of reconstruction aides in occupational therapy and much credit is due her for the very high quality of the ones secured.

The local hospital organization and administration will be more interesting and valuable to civil institutions than the details of the central office organization. Chart 9 shows graphically the general scheme of organization. The commanding officer of the hospital is superior local officer. The medical staff appears next and superior to the educational officer. This again shows clearly that the purpose of the educational service was to be primarily curative. The chief educational officer is in charge of the educational service. The position is not unlike that of the president of a college or vocational school, but with this difference, that the primary function of the school is therapeutic and consequently those who fix the policies and pass upon the general efficiency of the work are the medical officers and the general administrative officers of the post. The chief educational officer has on his staff an office administrative force which deals with all the instructors and heads of departments. The work of reconstruction is divided into four departments—psychological, statistical, technical, and recreational or physical education. Each of these departments in a completely organized hospital will have

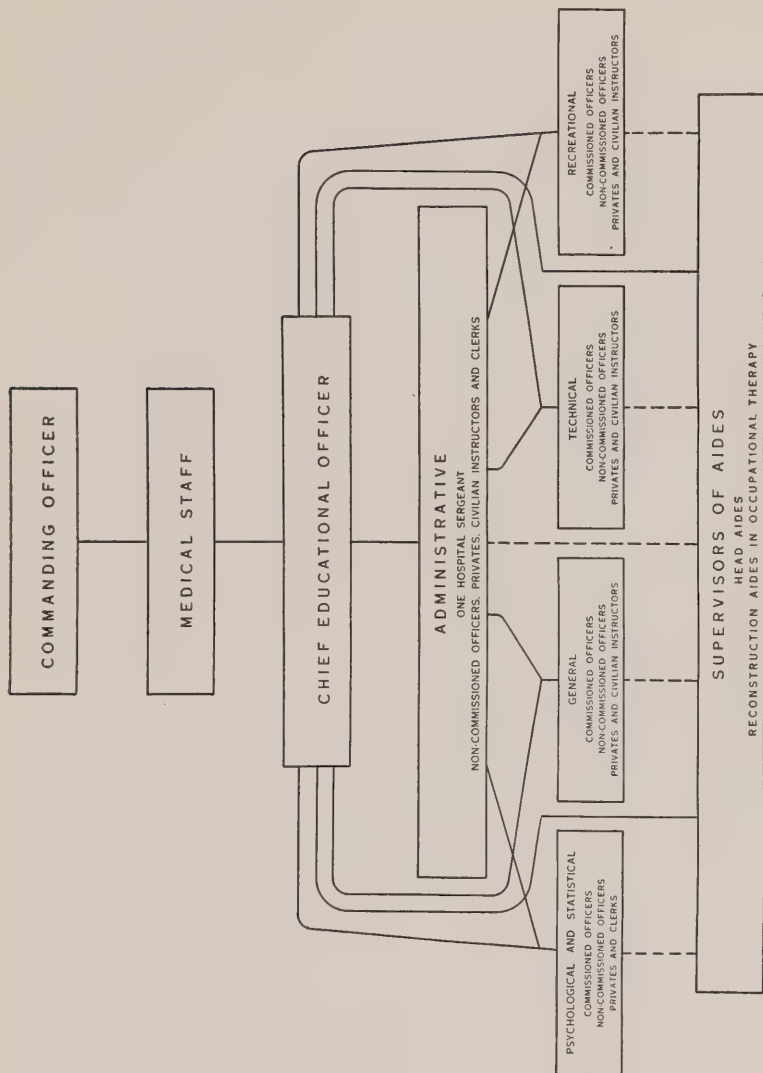


CHART 9. Organization of Educational Service in United States Army Hospitals Functioning in Physical Reconstruction

its chief and assistants. As the number of instructors on the staff of a hospital might number as high as one hundred twenty-five, it is evident that in each department there might be a faculty as large as is often found in small colleges.

The group of women known as reconstruction aides for occupational therapy is shown in the chart directly subordinate to the chief educational officer, but coöperating and participating in the work of the four general departments. At first this seems a peculiar arrangement. It is not far different, however, from the practice in civil institutions in which there is a large group of women instructors who appear in all departments of the school but for convenience are directly responsible to a dean of faculty women, who in hospital organizations corresponds to the supervisor of aides. Under the supervisor of aides are certain head aides, who are differentiated from each other by the class of work, as commercial, academic, shop, or craft. Many of these aides work directly under the supervision of heads of the four large departments, but come under the direction of the supervisor of aides in personal and general matters. The apparent duality of control will be more clearly understood if it is kept in mind that the occupational work could be divided into that carried on in shops and class-rooms for convalescent patients and that carried on in the wards for those in bed and those unable to leave the wards. In general, the ward work was done by women aides, the men working almost exclusively in the shops and class-rooms. Many of the women aides also worked in shops and class-rooms, though few of the men worked in the wards. The natural division of the work made it very convenient to have the aides in a group under the direction of a supervisor. Their participation in shop and class-room work and the necessity for connecting ward instruction with outside instruction made it necessary that these aides also be responsible to the heads of the four great departments. Chart 9 endeavors to show these relations by the use of dotted lines.

It is not necessary to give detailed directions of the work of various local officers, because in the main the name of a department suggests at once the general duties. The educational director and chief of administration was also accountable for all government property and official morale officer for the post. The administrative section took care of the usual official records

of all kinds. The psychological service will deserve more detailed description in later chapters. In the main it was responsible for the psychological and educational surveys of individual patients and the general oversight of the statistical work. The general department took care of instruction in academic subjects. The technical department included technical, commercial and agricultural subjects. The recreational and physical education department took charge of the gymnasium work and prescribed physical exercises, provided by the school, and acted as liaison officers with the cooperating volunteer agencies that furnished recreation and entertainment for the hospital patients. The supervisor of aides had a position similar to dean of faculty women, as already indicated.

The system of record keeping was elaborate. The new service, which touched so closely all other branches of hospital work and which was joined up with the home service of the Red Cross and the work of the Federal Board for Vocational Education, necessarily had to be exact in its records. Profiting by past experience it would now be possible to devise a somewhat simpler form of record, but even when reduced to lowest possible terms, much record work would be required. The records included prescriptions by the medical officer, followed by the survey record of the interviewing office. The survey record contained a statement of a man's army record, his identification data, a summary of his diagnosis, the special prescription, if any, the psychological examination, the social, vocational and educational history. Other records kept track of the assignment to classes and the progress, both curative and educational. Copies of the report record forms are included in the official history. For civilian practice undoubtedly appropriate forms would have to be especially devised. It is entirely probable, however, that the general organization of administration would prove as well adapted to civil institutions as it would to military.

As much of the attendance upon the educational service was voluntary, a regular campaign of intra-hospital advertising was carried on. The posters designed by the hospital art schools for this publicity work were attractive and effective. Hospital newspapers, varying from a small mimeographed news-letter to a newspaper of metropolitan dimensions, became excellent mediums for intra-hospital publicity as well as effecting an immediate

motive for instruction in English composition, in cartooning, in newspaper editing, managing, and printing.

The task of administration of a new service in military hospitals met naturally with many difficulties. The service was novel, experimental, often proceeding against the apathy or active hostility of the medical officers. Over-zealous enthusiasts made claims that could hardly be substantiated. The novelty of the service made its appeal to the general public and publicity was given to it which oftentimes ignored the service of the better established medical, surgical and nursing departments. Naturally this did not create the best of feeling. It was a service managed largely by emergency personnel unfamiliar with military procedure and ideals. The ignorance of military channels and methods often provoked undue friction, needless delays and obstructions. The inertia and unwieldiness of the great army organization also added its annoyance. The lack of established channels of communication and procurement of supplies, equipment or personnel added other delays and annoyances. The way of the educational administrator in a hospital was not smooth. It required men of tact, resource, courage, energy, and initiative together with technical educational knowledge and experience. Such men are not easily found even in an open market. These men must needs sell the service to the medical officers and patients, secure needed equipment out of nothing and train an inexperienced, constantly shifting personnel. They must maintain amicable relations of coöperation between all other branches of the military establishment. These were some of the larger difficulties met by educational administrative officers. To complicate matters, the armistice with the resulting cessation of promotion and commissions, with the rapid demobilization, further made the maintenance of high morale exceedingly difficult. That in a short period of four or five months these men and women found it possible to build up new educational service institutions in base and general hospitals, enrolling 40, 50, 90 per cent of the eligible patients, maintaining their interest and assisting them to rapid recovery while at the same time giving them vocational and educational values, speaks well for the energy and administrative ability of these officers and staff.



## CHAPTER V

### METHODS OF SURVEY, GUIDANCE, AND INSTRUCTION

THE methods developed under the stimulus of new conditions and a free program present the best lessons for education and for the reëducation of adults disabled in industry. As already described, the surveys which were made of the individual patients are most enlightening. The patient was studied until he could be described accurately as regards physical condition, both present and future, his social, educational and vocational history, his grade of intelligence and his plans and preferences for future vocation. These items were obtained from the medical and surgical officers, from the psychological examiner, and through interview with the patient himself. All this information formed the basis for vocational guidance. If such knowledge was needed in wisely directing the patient's work for a few weeks or months of convalescent time, how much more essential should such information be in guiding the years of educational preparation of young people in high schools and colleges. Did anyone ever hear of a college that early in the career of the student made a study of the individual student which even approximated the completeness of these army surveys? The need of physical examination is just becoming apparent. The army service has helped to develop in usable form psychological tests which will undoubtedly find application in civil institutions.

In securing these surveys, officers were selected who were specially fitted by personality and training to approach the patients tactfully. These survey officers should be possessed of keen powers of observation, sympathy, and judgment. They must be skilled in securing direct and complete statements without appearing inquisitorial. They must be capable of gathering from a patient's attitude, demeanor, evasions and omissions as much as from his actual answers. In the army service much of this survey was done by trained psychologists. When the psychologist was possessed of tact, pleasing personality, and good judg-

ment, his psychological training made him an especially good officer. The statistical type of book psychologist, however, who looked upon men as mere subjects for psychological investigation, proved far less trustworthy and successful than the keen observer, possessed of tact and a good knowledge of men and affairs. The survey officer soon found valuable a thorough acquaintance with the common industries and vocations, without which it was difficult for him to get accurate information on vocational and industrial lines.

When all surveys were completed, the information was placed in the hands of a vocational counsellor who oftentimes was the surveyor. With this complete picture of the individual before him and in conference with the patient, plans were laid for making the best use of the hospital opportunities. This often resolved itself into vocational guidance, looking forward to a vocation or education after discharge, and planning for the start during the hospital period. Vocational advisers were found to be rare, though in a majority of cases the course to be pursued in the hospital was plain. The more difficult cases, where plans were made for the future after discharge, and particularly if a new vocation was to be chosen, required a knowledge of men and industries and vocations difficult to find in the same person. Men with varied vocational experience proved the most helpful. A plan that proved very successful was the holding of conferences with men familiar with occupations, when the adviser felt that he needed more expert assistance. The heads of the various departments in the school frequently possessed knowledge of the opportunities of the lines embraced within their departments. The advantages of the short course as a try-out often proved enlightening, both to the student and to the instructor. Men discovered latent ability; some soon proved total unfitness; others showed aptitude but needed better elementary preparation. This latter class was often thereby persuaded to undertake needed preparation. The opportunity monographs, issued by the Federal Board for Vocational Education, describing the opportunities in the leading industries, should prove especially helpful to those undertaking vocational guidance. The study of vocations, their requirements and their possibilities, should appeal to high school teachers and administrators as very valuable subjects for secondary pupils. This does not mean the forcing of a pre-

mature selection, but means an intelligent early study of vocational requirements and advantages.

As stated in the discussion of curative results, the ideal series of projects often started with something merely diversional, leading on constantly into more purposeful activity with each succeeding project. To many soldiers the hospital became an opportunity for introduction to lines of activity that they never could have been persuaded to consider under the ordinary conditions of civil life. The enforced periods of idleness, the example of others about him, the earnest urging of people interested in his welfare made a combination of influences which worked upon the man, inducing him to think upon his own problems and persuading him to undertake more serious preparation. In the ordinary hurry and bustle of healthy activity in civil life, these influences could not have been brought to bear. The devices used to first secure the man's interest and response were ingenious and even ludicrous in their simplicity. Men who for days had professed indifference were often interested by a simple request for assistance by the instructor—the threading of a loom, the repairing of a piece of apparatus, the finishing of a project for a fellow patient. The contagion of doing what the others were doing often served to start the men on activities which before had only received their derision. Basketry led to sketching; sketching to mechanical drafting; mechanical drafting to blueprint reading. Knotted belts led to leather projects; these to harness repair. Typewriting led to accounting and commercial work or English. Reading led to small botanical window experiments; this to greenhouse work, gardening and agriculture. Toy-making led to the wood shop, or to mechanics, or to the machine shop. Had the work continued several years as was at first anticipated, it is certain that a much larger repertoire of projects, activities and diversions would have been developed. As it was, the list of principal craft projects developed steadily from a very few, such as weaving and knitting, to dozens of activities making more manly appeal and showing greater tendencies to lead on to useful occupations.

A "Score Card for Instructional and Diversional Projects for Men Confined to the Wards in United States Hospitals" is given in the official history. It was prepared as a guide in the selection and development of ward projects. It is worthy of study, though

certainly capable of improvement. Following is a brief summary of the points included in the score card:

- A. 1. The work must exert a good influence upon the man's recovery.
  - 2. Work must be suited to ward conditions.
  - 3. The project should be a man's task.
  - 4. Projects that naturally lead the man's thoughts out from the wards to the shop, to the school room and to future activities will be the most valuable.
- B. 1. The work must require little time from the instructor and relatively much greater expenditures of time and effort by the patient.
  - 2. Tasks with objective product which can be used by the man as gift or souvenir make strong appeal.
  - 3. Projects should be suitable for intermittent, short, unsupervised periods of activity.
- C. 1. Universality of appeal is a desirable quality in a project.
  - 2. Materials and equipment must be readily available.
  - 3. Variation from former occupation presents a diversional appeal.

The specifications in Group A can properly be counted as essentials; those in Group B are highly desirable; those in Group C may be determining factors, but their influence will be relative rather than absolute, and are more inherently matters of administration than of educational value.

The absolute certainty of limited time caused the development of short unit courses. Men did not care to undertake anything which threatened to detain them in the hospital. It was necessary to explain over and over again that the school activity was calculated to shorten, not lengthen the hospital period. It appealed to the men to know that the course in typewriting which they were starting could be completed in thirty hours, or that the course in mechanical drawing consisted of ten short lessons, taking about thirty hours. It was also apparent that effort had been made to select and organize subject-matter of instruction in such form as to give the student the most in the least possible time. It was concentration and elimination rather than amplification and collection of the non-essential. The unit courses were organized about a task. This was not the logical, conventional school method, where an orderly arrangement of processes is the plan. The project organized about the task cut through and included parts of many processes. This lent itself splendidly to the laboratory form of instruction. In vulcanizing, the task

was the repair of the casing or tube. In the carpenter shop, it was the making of an article of furniture or a model building. In the metal working shop, it was the design and manufacture of a piece of jewelry. In the machine shop, it was the design and manufacture of a tool. In auto mechanics, it was the repair and



SMALL TOOLS MADE BY PATIENTS  
Ft. Des Moines, Iowa

adjustment of an actual engine. In the electrical shop, it was the repair and care of a storage battery. In typewriting, it was a letter to the friends at home.

In order to provide for continuous progress for longer periods, series of courses were provided. The completion of any one of them gave the man mastery of some simple task which was part



of the vocation. The mastery of more of them gave him further skill in those tasks, and introduced him to other tasks which were component parts of the vocation.

The instruction was individual. If a group of men were working in the same subject at the same time, it was seldom that any large number of them were at the same place in the course. The class in typewriting met together at the same time, perhaps, but



AUTO MECHANICS

Practical short course instruction

East View, New York

each member was working individually on his own assignment. The instructor gave individual attention to each.

The men in the automobile shop might each be working at a different project. The instructor became more like a foreman who moved about from man to man or group to group giving suggestion and instruction. Men came in at any time of day for any length of time that their condition and program of treatments would allow. Some worked long periods and others very short periods. It was surprising to note the number of men that could be instructed under this plan, and yet each student was receiving individual attention.

To assist in organizing the instruction on the unit course basis the Surgeon General's Office prepared monographs called "Unit Courses of Study." These were prepared under the direction of a joint committee from the Federal Board for Vocational Education and the Surgeon General's Office. The committee met at Teachers College, Columbia University, and, in coöperation with Dr. David Snedden, caused sixty-seven unit courses to be prepared. No field was covered completely, the aim being to furnish a unit or two in as many different fields as possible, in order that this unit might serve to demonstrate to instructors in that field the possibilities for the preparation of other like units.

Though the courses were delayed in printing, failing to reach many of the hospitals until after their work had already been organized, yet the influence of these pamphlets was great. They served as models, not only in the fields in which they were prepared, but also in other departments. As a guide to collaborators the committee drew up a set of specifications which were to be followed in the preparation of the courses. These specifications were briefly as follows:

1. A unit course of study was defined as an organized unit of instruction comprising suggestions for teachers and instruction sheets for students.

2. All courses were to be adapted to the needs of disabled soldiers and written in short units, each reasonably complete within itself, each related to the other units of the course, each correlating with agencies of later instruction, providing for modification to suit individual needs, adapted to individual instruction rather than class work and divided into definite lessons, jobs, or tasks. Each instructor's manual was required to provide directions for conducting the work, including a description of the qualifications of the student for whom the course was intended; to state the attainment or advantage expected to be derived by the student; to state the approximate time required to complete the course; to list necessary equipment and material; and to suggest standards for measuring, rating and recording student's work.

3. Students' instructions sheets were required to be used separately lesson by lesson; to give references for required study; to give specific statement of the task, job, problem, or experiment

constituting each lesson; and to provide questions for further study.

4. Unit Course Series, No. 25, "Specification and Prospectus for the Joint Series of Rehabilitation Courses for Disabled," contains a full account of the preparation of these courses, together with a statement of specifications, lists of units already published, and proposed "break-up" for other courses in various fields.

## CHAPTER VI

### LESSONS FOR SCHOOLS AND FOR THE EDUCATION OF THE DISABLED IN INDUSTRY

STATISTICS giving accurate information regarding the number and kinds of injuries in industry are difficult to obtain if one wishes to include the entire nation. An increasing number of states, however, are establishing statistical bureaus and an increasing amount of accurate data is being accumulated. Enough is known to show the frequency and seriousness of industrial accidents and the loss which they occasion to the state.

The Department of Labor and Industries in Pennsylvania receives an average daily list of 650<sup>1</sup> workers injured in the industries in that state. Injuries are reported only when fatal or resulting in a disability for a period exceeding two days. During the two and a half years ending July 1, 1918, 577,053 injuries to workers have been reported to the department. This included 7,575 fatalities. During this period 3,798 amputations of arms, legs, hands, feet, fingers or toes were reported, and the loss of 1,157 eyes. Twenty-nine men were totally blinded. One of the blinded also lost a left hand, one a right arm, and one both hands in the accidents that blinded them. During the same period five workers lost both hands; six workers lost both legs; three workers lost both feet; four workers lost both an arm and a foot; five workers lost both an eye and a hand; two workers lost a leg and a foot; two lost an arm and a leg; and two lost both arms. These cases are sufficient to show that the injuries received were fully as severe as those suffered by the soldiers.

In the year 1918 Pennsylvania reports 184,844 accidents, 3,403 of which were fatal and 53,783 serious. A serious injury is one resulting in loss of fourteen days or more of working time. These serious injuries included loss of parts as follows: Eyes lost, 151 cases; arms lost, 60; hands lost, 98; fingers, 1,148; legs, 131;

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<sup>1</sup>Lew R. Palmer, "Employment Opportunities for Pennsylvanians Disabled in War Service," *The Annals of the American Academy of Political and Social Science*, November, 1918.

feet, 108; toes, 160. The total number of days lost aggregated 2,767,471, or a total wage of \$10,286,872. Dependents of those seriously or fatally injured added 153,290 people to the seriousness of the problem. Compensation awarded in 1918 in the state of Pennsylvania aggregated \$11,639,915. Certainly there is a chance for proper industrial reëducation.

According to figures given by Gilbert L. Campbell, in *Industrial Accidents and Their Compensation*, published in 1911, "the railroads from 1902 to 1908 reported 335,964 injured, or an average of 47,995 injuries per year. The average number of employees during the same period was 1,404,549 per year, showing that each man who was employed a full year stood one chance in twenty-nine of being injured. If he worked for the seven years he stood one chance in four of being injured seriously enough to be reported to the Inter-State Commerce Commission."

The United States Bureau of Labor Statistics, Bulletin No. 157, reports, in 1912, 661 fatalities in the United States; 4,502 serious injuries and 26,232 slight injuries. In the *Monthly Labor Review* of November, 1919, Lucian W. Chaney states that in 1915-18 there were in the iron and steel industry 1,256 fatalities, 3,572 permanent injuries and 144,126 temporary injuries.

The United States Bureau of Labor, Bulletin No. 157, reports Wisconsin figures for 1911 showing 94 farmers seriously injured, 4 deaths, 6 cases of arms lost, 21 cases of hands lost and estimated economic loss of \$307,000. Corn shredders, huskers and corn cutters were responsible for 59 cases; feed and ensilage cutters caused 35 injuries. It is probable that many farmers' injuries failed to be reported and tabulated by the commission. With the tremendous increase of high powered agricultural machinery the farming accidents are multiplying in number and increasing in seriousness.

Nearly all the figures on industrial accidents agree that more than half the number of injured are between the ages of twenty and forty; that is, they are at the period of life when men are most productive and when most men have the largest number of dependents. For example, the average age of workmen injured in Illinois in 1915 was thirty-five years.

Mr. Campbell, in the work already cited, estimates an annual total of serious injuries in industry of 16,000 per year. He arrives at this from the reports from New York, Ohio, and Michigan,



which give a ratio of nine serious injuries to each fatal accident. The United States Census for 1910 reports the deaths of 126,567 adult males from 1900 to 1906, inclusive. Of these the Census estimates 9.1 per cent, or 12,918, were due to accidents. The ratio of 9 would indicate over 112,000 serious injuries, or 16,000 per year. This is a very low estimate according to the figures from individual states.

Frederick L. Hoffman, of the United States Bureau of Labor Statistics, estimates that in 1913 there were 25,000 fatalities and 700,000 injuries in industries, including only injuries of over four weeks in duration. This is a wide variation of estimates, but whatever the real figures may be enough has been shown to demonstrate conclusively the magnitude of the task and the tremendous gain that would be made if even a small percentage of these disabled workmen can benefit by reëducation which will enable them to overcome their handicaps. Moreover, it is not only the persons disabled in industry who may become a burden to themselves and to society, but the disabled person whose injury comes from any cause whatsoever.

In one large steel plant an account of injuries was kept from 1906 to 1913, inclusive, showing their distribution among the American born, the English-speaking foreign born and the non-English-speaking foreign born. Throughout the eight years the accident frequency rates were higher in the non-English-speaking group than either of the other groups, and in five years of the eight, greater than the rates in both of the other groups combined. The frequency rates are the number of accidents per 1,000, 300-day workers. The frequency rates for the total number of accidents during the eight years was 90 for the American born, 98 for the English-speaking foreign born, and 212 for the non-English-speaking foreign born. During the same eight years the accident severity rate (days lost per 300-day worker) showed that the non-English-speaking worker had the highest rate five years out of the eight. Surely, such figures leave no room for argument for teaching the common arts of English communication to all workmen, both the uninjured and the injured, if for no other reason than the avoiding of accidents and compensation claims.

The Bureau of Mines in the Department of the Interior reports quarry accidents in the United States in 1915 as 9,819, 148 of which were fatal, 523 permanent, 1,365 serious, 7,783 slight,

resulting in the loss of less than fourteen days' time. In 1916, 472 were reported as permanently disabled, 2,194 seriously injured, and 10,761 with slight injuries. The same report shows that the number of injuries has increased steadily from 5,390 in 1911 to 13,427 in 1916.

It must not be assumed from these or other figures which are given regarding permanent injuries that all such will need educational rehabilitation. A permanent injury does not always incapacitate the man for successful work in his former occupation. Permanent vocational disability is not always the same as permanent physical disability. To ascertain the number of men disabled in industry who will need vocational education is one of the tasks for those interested in the rehabilitation of the disabled. It is already known, however, that the number is large and worthy of attention.

The number of dependents left by the death of workmen is large. This suggests another problem for the rehabilitation of disabled in industry, as the dependents of these workers must themselves now become wage-earners. They may as properly claim the rights to vocational education as those who have suffered bodily disability. In each case their means of support has been removed by an accident in industrial production. If to this list of dependents could be added those dependent upon the men who have suffered total disability, but yet live, there will appear another large group whose economic difficulties may be even greater than the group whose sustaining members have been killed. In both cases there is a loss of income, but in the case of those totally disabled there also appears an item of increased expense in the care and support of the disabled one. Here again the new breadwinners, forced to take up the burden of support, would have a good claim for vocational education.

The chief mining inspector of Pennsylvania in his 1906 report says, "During the years 1900 to 1906 inclusive, mining casualties in Pennsylvania left 1,611 widows, and 3,410 orphans under fourteen years. . . . When a state enacts a law prohibiting the employment of children until they reach the ages of fourteen or sixteen years, it should in justice provide some way whereby the children can be taken care of until they are legally permitted to be employed. . . . I have lived a lifetime among the mine workers, and I know whereof I speak when I say that

humanity demands that some provision be made for these widows and orphans."

The president of the Board of Commissioners of Cook County, Illinois, in his report for 1907 says, "Injuries received in industrial pursuits are adding each year scores of persons and families to the relief list of the County Agent's Office. Hundreds of able-bodied men in the prime of life are annually receiving injuries which result in the loss of life, limbs, or health, and make many of them, or their families, county charges. Most of these men have large families and when the breadwinner is killed or incapacitated, he usually leaves them without means of support."

That this problem of dependents and training of new breadwinners is serious, is also shown by the statistics giving the ages of men injured in industry. Mr. Campbell states that the experience in Minnesota, Illinois, Wisconsin, and Pittsburg shows that 45 per cent of industrial casualties were under thirty years of age, that 80 per cent were under forty years, and that 90 per cent had not reached fifty. Men in these ages are still in the productive period of life with their families dependent upon them. These dependents strengthen the claim for rehabilitation.

The disabled soldiers represented a large variety of injuries and sickness, of all degrees of severity. It is not likely that injuries and sickness of the civil population will vary much in degree or kind from those in the army, except that industry has a much wider range of ages and includes both sexes. For example, there seems no good reason why rehabilitation of tuberculous soldiers should be very different from the rehabilitation of civilians. All will have the same necessity for diversion during the quiescent periods of treatment and all will feel the vocational appeal, strong for those still in the productive periods of life and weaker for the extremely young or for the extremely old. All will have the same need of the hardening treatment as a precaution against relapse. The problem for tuberculous women patients can differ only in the character of the vocational appeal, and as a majority of women are homemakers, the vocational field will be much more limited and the problem correspondingly more simple.

If the disability be the loss of a limb, the problem still remains much the same. It becomes the problem of maintaining hospital morale, developing and training the stump, and training the mind and remaining members to compensate for the loss. The

vocational problem cannot differ greatly with civilians from that with soldiers, because the soldiers represented so fairly and completely the prevailing industries of the country.

For civilian hospitals the problem may vary in that the patients in civilian hospitals do not ordinarily remain for long periods of convalescence. Such periods are more commonly spent at the patients' homes, with occasional visits to the hospitals for examinations and treatments. The civilian hospitals might, however, profitably consider the use of occupational therapy in its diversional uses. The improved morale, the more hopeful attitude, would be potent elements in the treatment. Sanitaria might possibly find occupational therapy of an attractive nature an inducement to prospective patients looking for pleasant surroundings for long periods of treatment. State institutions for the chronic cases of mental or physical disability have already shown the value of occupational therapy, though few have yet realized its great possibilities.

#### NECESSITY OF SURVEYS AND GUIDANCE

One of the first steps in hospital procedure that is worthy of note is the survey. This, as already described, is a complete picture of the patient, gathered from all convenient sources, made a matter of record and used as a basis for all subsequent educational or vocational work. This survey includes the findings of medical and surgical officers relating to a man's physical condition and a prognosis of his final state upon recovery. It is upon this also that the probable time a man may have available is ascertained. From the man himself is secured his educational, vocational, and social history. A trained specialist adds to this his estimate of the man's mentality and the quickness and type of his reactions. If necessary, psychological tests add their evidence to the description of the patient.

It is certain that schools can do well to take note of these things. Medical examination is already finding its place in the schools. It is possible to train teachers to find and record pertinent facts regarding the child's social and educational history. In thousands of cases, judging by the number of pupils who leave school at early ages, it might be in order to consider seriously the probable amount of time that the child will attend school. If schools knew positively that many of their students were spend-







hospitals gathered men from such large areas that each hospital represented almost all the common industries. Disabled civilians are likely to be found in communities or small regions embracing a smaller number of industries. The vocational adviser will need thorough knowledge of the prevailing industries of his section plus knowledge of some industries outside of that section. Undoubtedly competent educational vocational advisers must be recruited and trained before any large supply is available. If any state, however, should seriously attempt rehabilitation of the disabled in industry, it is probable that vocational advisers with personal experience in the industry of the region can be found, possibly among disabled members of the prevailing industries.

Vocational advice for the disabled in civilian life will have a deeper significance than it had in army hospitals. The advisers in the army hospital were immediately concerned only with the soldier's hospital life, though naturally this was guided by the man's vocational preference for his life after discharge. But since there was no assurance that he would follow the adviser's plans the adviser was relieved of responsibility. There was also the added thought that the hospital period could be used as an experimental observation period for self-discovery on the part of the man and for observation on the part of instructors. When in doubt the army vocational counselors could always fall back on the thought that the army service was primarily curative, and the future vocational choice was not so much his concern.

A state which attempts rehabilitation of its disabled will need to recruit and train its vocational advisers and furnish them with reliable statistics regarding the qualifications required of workers, the working conditions, the future of the employment and the available supply of workers in that industry. Such facts are not easy to obtain accurately, nor is it possible to secure them once for all, for the constant shifting of industrial demand, the effects of invention, and changes in markets will necessitate constant revision of such data. There will, however, be advantages to others than the disabled if such figures are kept accurately.

METHODS OF INSTRUCTION

For curative purposes the appeal of motive was exceedingly important. Generally the most powerful appeal was that of vocational usefulness. The motives of avocation and diversion were also effective. Nothing, however, stimulated serious, sustained effort like the appeal of vocational usefulness. Courses in tire vulcanizing presented this appeal strongly. A short course was sufficient to insure the man upon discharge from hospital an immediate job at paying wages and an independent business of his own if he became a successful craftsman. Without the strong appealing motive the work of the men was without true effort, its curative value was much lessened, and educational value was practically nullified.

Educational institutions can well take this lesson to heart and critically examine the motives which now actuate their students. Rehabilitation of the disabled in industry will have an immediate and all-powerful motive in almost all cases. Its students should need no persuasion as to the value of thorough preparation. It will be an imperative necessity.

European experience is said to have found that among disabled soldiers who had no educational courses in hospitals but 10 per cent could be persuaded after discharge to present themselves for training, while of those who had educational advantages within the hospitals, 80 per cent presented themselves for training after discharge. It will be interesting to note the percentage of men among the number finally trained by the Federal Board for Vocational Education who at first attended hospital schools. Whatever the exact figures may be, it is certain that an early appeal to the patient is desirable. In the case of United States soldiers a furlough, giving opportunity for the counsels of the friends at home, has often discouraged the man from making an adequate vocational preparation. It has been one of the functions of the educational and Red Cross workers in the hospitals to assist in critical cases by writing letters to friends and relatives in advance of a soldier's furlough, asking the home folks to assist in persuading the man to take advantage of the opportunities in the hospital and those afforded by the Federal Board for Vocational Education. The sick man's time of greatest misfortune may be the best opportunity to present to him the possibilities

of rehabilitation. The early appeal then, besides bringing about a hopeful state of mind calculated to assist recovery, was helpful to inspire a brave determination to secure adequate preparation.

The qualifications of the students in army hospital schools are shown in the tables on education, intelligence ratings, and vocational preferences, and afford some basis for estimating the probable conditions to be met with in a group in industry. In education it is probable that the army presented a very fair cross-section of the American people. In intelligence ratings and in physical condition the men were undoubtedly above the average for men of the same ages. The sifting process of the local draft boards and army medical examiners had seen to this.

Probably in no other feature is the work of the army schools so valuable for the guidance of those interested in the rehabilitation of the disabled in industry as in the organization of instruction in the so-called short unit courses. There is little new in this organization that has not already been known and tried in schools, particularly night schools, correspondence instruction and the so-called short courses of our higher educational institutions. The army aimed to combine the best features and procedure of such courses wherever found. The principles underlying such short unit courses have been described. It mattered not whether the course as given by the instructor had been issued in printed manual or whether any written outline existed. The fact remained that the most successful courses of instruction still followed the essential features of short course instruction.

The vocation was divided into tasks and some one of them selected as a unit of instruction. Small tool making for machine shop practice is an excellent illustration. Such tool making might require a little work with hot iron, some chipping, filing, boring, threading, or some mechanical drafting, blueprint reading, model making, casting, finishing of castings. If mechanical drafting, blueprint reading, pattern making, casting, grinding, lathe finishing, planer work and other machine shop processes could be considered as horizontal strata composing the whole craft of machine shop practice, then a unit course in making a particular tool might be thought of as a vertical division, cutting across all the horizontal process strata. Much the same might be said of agriculture. The task might be the raising of poultry, or better, the raising of a particular brood of chickens. It would

include problems of selection of breeds, hatching, feeding, sanitation, marketing, etc. This centering of instruction about the task is not the logical, conventional procedure of the schools. However, for motive and interest, for similarity to actual industrial conditions, in possibilities for acquiring a sustaining foothold in the industry in the shortest possible time, it presents manifold advantages. Moreover, the unit course made it easier to per-



TYPESETTING  
Ft. McHenry, Maryland  
Instruction in printing can begin early

suade men to undertake adequate courses of preparation. Its purpose can be stated definitely in terms of a task or job, in learning time and in earning possibilities.

It may be feared that such short, intensive courses of instruction may degenerate into teaching a trick rather than an understanding of the principles underlying the intelligent performance of a task. There is danger of this unless the instructor points the way to supplemental reading and study and discusses with the student the principles underlying the procedure. The danger of teaching device and routine procedure and turning out men who can do but cannot fully explain why they do will be no worse than graduating men who can explain glibly but can accomplish



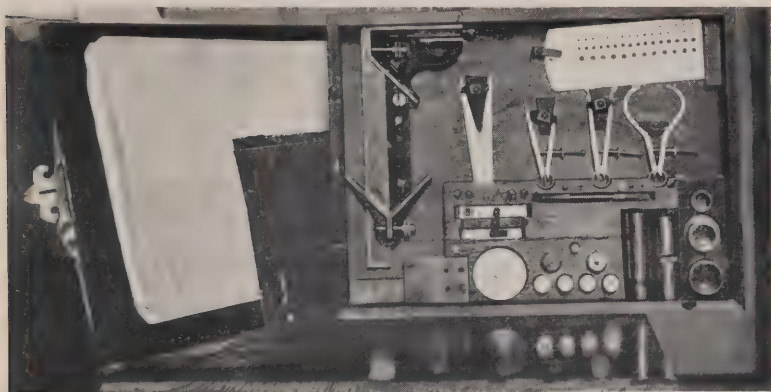
little. Moreover, explanation and principles can more easily be acquired upon a foundation of experience in action than application can be mastered upon a basis of theory. If army experience is a reliable guide, the successful learning of one task will not leave the learner content with his accomplishment, but will make him eager to undertake a more difficult and advanced part of the vocation, if the vocation has been properly divided into its tasks or jobs, even though there is not a hard and fast sequence.

Another advantage of the unit course is its fitness for purposes of instruction in classes of men varying in vocational experience, schooling and mentality. It is not possible to give uniform class instruction. It must be an individual matter. The division into jobs and tasks made it possible for one instructor to teach many students, each in a different task. It became indeed a school where anyone might start at any time, at any place in the curriculum that he was fitted to work. Unless there be long waiting periods in order to collect men of like attainments in groups and start them together and at the same point in the scheme of instruction, it will be necessary for the rehabilitation of disabled in industry that provision be made for individual progress and individual instruction.

To give individual instruction, it will not be necessary that each instructor have a large library of text-books, but it will be advisable either that the text-books be written as a collection of tasks or that the instructor have a file of lesson sheets for a multitude of different tasks. Each set of instructions should contain directions for the student's procedure and references to accepted text-books and manuals. For example, an instructor in auto mechanics would have a shop equipped with a great variety of automobile parts and cars for experimentation and repair. He would have a good working library of the best general books on the subject and a collection of individual manuals for the several makes of cars. He might then have a file of manuscripts, type-written, perhaps, or some printed monographs, each describing a particular task likely to occur in repair or upkeep of automobiles. There should be many such lesson sheets, each containing instructions to the student for his procedure, with references to the best library helps on the subject. He would be expected to translate written instructions into actions, the instructor



helping only when the student was in need. With lesson sheets for a large number of tasks, the instructor would be prepared to outline programs of instruction for nearly any man at any time. A card index of his men would enable him to keep a record of the tasks mastered by each man, avoiding uneducative repetition and insuring a reasonably complete training. In the manufacturing industries where specialization is more pronounced, it is probable that the unit course organization could be even simpler.



LESSONS IN ACCURATE MEASURING  
Ft. Des Moines, Iowa

A "package project" for bedside instruction

For educational institutions in general, the possibilities of organizing instruction on the short unit course plan, particularly in fields of science and manual arts, should not be overlooked. Electricity studied in connection with a telegraph project may be studied much more profitably than if the logical, conventional method be followed by first considering all known forms of electric batteries, then the history of galvanic electricity, followed by several weeks study of electro-magnets, the behavior of electric currents, conduction, resistance, induction, and finally winding up with a short study of telegraphic application of the principles pursued through such a long, tiresome, logical sequence. The writer knows from his personal observation that the successful installation of a telegraph line brings a practical knowledge of batteries, resistance, conduction, induction, and

electro-magnets, which gives to the young experimenter more real and intimate knowledge than he will obtain through the most painstakingly logical development of the study of electricity.

#### SIMPLICITY OF THE EQUIPMENT USED

For the purposes of institutions and hospitals, one pleasing feature of army experience has been the simplicity of equipment and supplies. Diversional occupations in a hospital ward succeeded most admirably when there was available at an end of the ward, or on a porch adjacent to the ward, a small space large enough for a half dozen workers, for whom the little shop became a sort of club room, a part of the ward, and yet removed somewhat from the monotonous hospital conditions. This little space contained some chairs and a few improvised benches, a scroll saw for toy-making, a small equipment for wood carving, some materials for basketry, a little vise and tools for jewelry work, some materials and equipment for leather work, a small loom for weaving, or other textile craft. A central supply and equipment room for the hospital was, of course, necessary. The teacher in one of these ward shops had to know a number of simple crafts, but she always had the assistance of other instructors, each of whom was something of a specialist, capable of instructing the others. For bed patients, reading, book study, telegraphy, drawing, beadwork, weaving, basketry, carving were all provided with simple and inexpensive equipment. Typewriting, one of the most popular and valuable studies, required a more expensive equipment, but one easily housed and suited to hospital conditions. Naturally, institutions which endeavor to carry instruction beyond the diversional into the periods of convalescence and further, will require more elaborate shops, libraries, and more specialized instructors. The existing educational institutions can very profitably be utilized for this advanced training. For the early start of such training, however, book study and elementary diversional crafts will require little equipment.

A striking feature of the army hospitals was the cheery air maintained by the patients. It was not the fashion to complain or whine. Each made the best of his condition. Though each had severe spells of despondency and discouragement, yet the general atmosphere was one of cheer. The explanation for this

may not be simple, but certainly some reasons can be detected. First of all, the men were brave. They were soldiers. American soldiers! They were young men imbued with the indomitable energy and courage of America. They had "done their bits" in an honorable fashion. Their scars were scars of honor. They were glad to have fared more fortunately than their fellows left in the soil of France.

There were other reasons. Each could find someone worse off than himself. "Misery loves company," and there was plenty of company. All were alike sufferers in the same cause. They were the center of attraction, the men for whom the whole service existed. The spirit of indomitable optimism, the spirit of endeavor pervaded the whole institution.

The contagion of example was clearly evident in the popularity of the different crafts and different projects. This month the whole hospital might be making bead chains; next month everyone made baskets and did wood carving; or in the more serious projects the commercial department had a run, then the recruits swung to the academic subjects or to the shops. Though these shifts in popularity may not always have been wise, yet they showed the wonderful force of example. It is not yet certain that the experiment of placing one or two disabled men in an institution of whole men will work out successfully. The disabled men have peculiar handicaps and difficulties, particularly in the initial stages of their education, and will feel these handicaps more keenly if constantly confronted with and placed in competition with more fortunate individuals. This may be particularly true if they be handicapped not only physically but by inferior schooling or even native mental ability. If such men can be educated, at least in the initial periods of preparation, in groups where they have the benefit of each other's company and example, where they can catch the spirit of optimism and hopefulness, where each inspires the other to greater efforts, it is probable that the percentage of discouraged failures will be less.

The hardest time for the disabled American soldier is likely to be, not when he is in the hospital attended by nurses and physicians, surrounded by those in like plight, where competition is with other disabled men, but when he returns home and doffs the khaki. Instead of a disabled soldier he becomes a cripple, conspicuous because of his disability, alone and competing with

men more fortunate than himself. He will face his most serious difficulty when he feels that he must do things and finds his disability hampering him, even though surrounded by his friends; for the sympathy of friends and even of relatives will cool in time, leaving him more bereft than before unless he has learned to do without their sympathy and assistance.

As a means of combating this situation the authorities in charge of the reconstruction and rehabilitation work for American soldiers have seriously considered the establishment of camps or schools intermediate between hospital training and the training in civil institutions. In these schools an individual's entrance deficiencies would be corrected and instruction would be made continuous, bridging over the time between hospital discharge and opening of suitable courses in institutions. They would also provide the benefit which comes to the man from group intercourse. If such intermediate schools are found to be sufficient, it will lessen the expense of education to the extent to which existing institutions can be utilized.

Undoubtedly it will be advisable to have an administrative board representative of educational systems and the chief industries, as well as the public at large. As executive officer such administrative board will require a director who will need, especially until such service can be more thoroughly established, assistants and appropriation for making surveys of the number and kind of industrial disabilities and the requirements and possibilities in the industries. He will need money and men to assist in training vocational advisers and instructors. He will need appropriations for renting or building institutions for the accomplishment of such parts of the work as cannot be profitably undertaken in existing institutions. He will need money for the support of students in training and their dependents, as well as funds for the actual training of the disabled.

It is not the province of this monograph to suggest methods of organization and administration, except as the work in army hospitals may suggest plans. The army problem was a simpler one than that of rehabilitation of the disabled in industry in a state whose sick and disabled may include men and women of all ages and whose re-training must be carried beyond the hospital to a point where they may again become vocationally competent.



The tuberculosis hospitals, the hospitals for the insane, and other institutions, can undoubtedly follow the army organization very closely. If desired, the introduction of occupational therapy can be made on a small scale using a few experienced people, under the leadership of one supervisor or chief educational officer. The army had some difficulty in inducing instructors to work with the insane and the tuberculous until such people had actually made a trial. Then the knowledge of the success of the service, its great need, and the alluring problems presenting themselves made the service intensely interesting and made it easy to retain competent instructors. The task became not that of guardian or keeper, but that of teacher and healer. There is a vast difference between these two outlooks. It would not be surprising if the introduction of occupational therapy in the hospitals for the insane and the tuberculous would result in inducing a high class of professional people to enter the service of these institutions, and by making the service more interesting and more valuable would make possible the retention of such help.

No description of reconstruction will be complete that omits to mention the greatest service that can possibly be rendered to any disabled man or woman. Michael Dowling says, "There is no cripple where the mind functions." The greatest factor in overcoming handicaps of any kind, mental or physical, is the will to work, the unconquerable resolve, the faith in one's self, in one's powers and possibilities. If such will to work and such faith in one's self be not blind, if the way to overcome be known, if the road to accomplishment be pointed out, then success is more certain.

The thing which leaves disabled people dependent upon society is not so often disability as it is lack of ambition, an unwillingness to pay the price of competence and independence. Michael Dowling, and thousands of other men, have succeeded in measurably overcoming great handicaps, primarily not so much because of great native mental ability, but because of firm determination that they would win. Reconstruction service, then, that counts for the most will not neglect this feature, but will plan to arouse ambition, hope, and desire, and will demonstrate the possibilities of proper preparation and point the way to securing such preparation. These aims were constantly kept



before the army workers. Though the first project might be trivial, it was aimed to arouse interest and promote acquaintance with instructors, in order that the next project would be more purposeful and that finally before the hospital career was over the man would have discovered for himself the possibilities for him to learn and overcome through proper training. He then was referred to the offer of the United States government extended through the Federal Board for Vocational Education. Promoters of vocational rehabilitation of the disabled in industry will do well to heed this lesson. To prevent men becoming content with being cripples and dependents, to make them willing to prepare adequately may be the hardest task in reconstruction.

## APPENDIX



## APPENDIX

### STUDIES OF INDIVIDUAL CASES

#### WEAVING FOR MANIC DEPRESSIVE TYPE

A. R., 25 years of age, truck driver, fifth grade education at the age of 14.

"The surgeon states on July 29, 1919, that patient was greatly disturbed and depressed. Sits with head bent over beside bed, crying. Not oriented. No insight and indefinite hallucinations. Motor condition slowed. Delusions of persecutions.

"The instructor reports that from the first Private R. did excellent work on anything that was put into his hands. He worked willingly but had no interest in it. He made baskets, did bookbinding work, such as making writing portfolios and kodak books; also simple weaving on the small looms. But for six weeks he took little real interest in anything. Then one day we set him to work on a foot-power loom. He became interested almost at once. From weaving colonial rugs he turned to weaving bags. As we had only a two-harness loom he picked out with the shuttle the borders he used. In two weeks the improvement was so marked that he was put on parole and for a week has been attending a class in motor mechanics.

"There is little doubt that the occupational work has done much to restore confidence and has contributed greatly to his improvement."

#### MECHANICS FOR MORON AND NEURASTHENIA

T. C., Private of Engineering Train, 30 years of age, a farmer by occupation, was diagnosed as mental deficient (moron).

"General condition not feeling well; appetite poor; gains no strength from food; not depressed; memory good; speaks slowly; no delusions or hallucinations. Never went to school, but reads and writes very little; unable to do simple problems. Mental age by Simon-Binet test is 9 years. Psychoneurosis Neurasthenia.

"When T. C. signed for woodwork he stated when he entered that it was for curiosity. He was very nervous and weak from nervous breakdown and first stood around for several days as if he was lost. The instructor talked with him and he began to show some interest, and the result is that natural ability has been uncovered not known of before.

"T. C., although forgetful at times, can do almost any kind of mechanical work with great efficiency. He had no special trade when he entered the army, was really a hobo, but to-day he is one of our best mechanics both in woodworking and machinery."

## ACADEMIC WORK IN MENTAL DEFICIENCY

M. K., Private in Infantry, 27 years of age, no schooling, sawyer by occupation, was diagnosed as a case of mental deficiency.

"His education began in the training camp. At first he was supposed to be either stupid or vicious, but upon examination it has been found that there is no mental trouble, his difficulty being a lack of knowledge of the English language.

"He was two months in a French hospital and when he returned to New York, April 17, 1919, was sent to a general hospital there. He completed several raffia baskets and a hammock while there, and after being transferred to General Hospital No. 43 made a knotted belt and several more raffia and reed baskets.

"He was enrolled in the academic department in this hospital in reading and writing, July 3, 1919. At first he was very slow and timid and it was found that he could neither read nor write and had a poor command of English, due, he said, to his having lived in a Russian community in this country. He was so backward that he would talk only in whispers or look piteously at the teacher. In the beginning his attendance was very regular but his progress slow. During the hot month of August his attendance was less regular and he stopped almost entirely for a week or two. A little later he showed more interest, attended regularly, and showed marked improvement.

"He asked to be enrolled in spelling and English September 26. He also did some work in arithmetic. His progress in the last month has been so great that he does not appear like the same man. He has always been interested in his work and is very anxious to increase his vocabulary. He has shown steady improvement. He can read almost anything with good expression and explain its meaning, seldom missing a word in spelling. He writes well and grammatically. He has an unusual choice of words and uses remarkably good grammar. He can talk connectedly about any general subject and remembers most of the explanations given in class. Towards the last, he has been quite talkative and is very anxious to continue his studies in civilian life. He appears perfectly normal and is being discharged to cross the continent to his home without an attendant."

## STUDY OF ENGLISH IMPROVES MORALE

Camp Dodge reports the case of A. C., a Pole, from Polish community in northern agricultural state, almost illiterate in Polish and entirely so in English, entered the service in June, 1918, and was disabled in October.

"He became able to write, to read, to converse in English. Through error in writing his name, has received no pay since entering the hospital. His increased knowledge of English enabled him to correct this and he received \$180 back pay, half of which was sent forward to his mother. He has written letters in English to his mother which she has proudly read to the neighbors. Before beginning work he was morose, non-communicative and seclusive. Since beginning he has ventured upon several occasions to converse with his



fellow ward men. He has lost his moroseness and has gone from the ward to general mess upon several occasions and has begun to mingle with other men, and strange as it may seem, it was through the reconstruction aide, his teacher, that the first knowledge that the war was really over was brought to him."

#### FARM TRACTOR STUDY FOR MORALE

Camp Lewis reports a case of improvement in general mental tone. L. B., native of Illinois, eighth grade schooling, farmer, gunshot wound in right ankle, November 1, 1918, at Odenaire, Belgium, will probably recover.

"An unusually bright appearing chap but perfectly willing to do nothing. Very abrupt, even rude, when ward work was suggested. Suddenly he capitulated and has done some very good work with marked increase of cheerfulness. He is now studying farm tractors."

#### AMPUTATION CASES

Amputation cases have scattered throughout a large range of activities. Those with arm amputation have frequently found it worth while to enter penmanship and typewriting classes in order to acquire a new writing hand. Walter Reed reports amputation case taking work for illiteracy.

"Private F. L. C., enrolled January 15 and left March 19, native of North Carolina, mountaineer with meagre education. He possessed a good vocabulary of spoken English but could barely read or write his own name. He was sensitive about his ignorance and desired to learn to read and write his own letters. He loved to read, especially the history of America, concerning which he was ignorant. His reading, at first slow and stilted, soon became more expressive and full of meaning. His writing took better form all the time and was always legible. At time of discharge he was able to compose a letter containing a few simple sentences and could narrate stories he had read with fairly full detail."

#### WOODWORKING FOR NERVE INJURY

Fort Sam Houston reports the use of the wood shop in nerve cases. Private J. M. M., at Chateau Thierry, compound fracture of left humerus with musculo-spiral paralysis. Little use of left hand and arm. A laborer with third grade schooling.

Visited wood shop "just looking around to see what he could find to do." He found a scroll saw and started; he kept at it. "This work stimulates the use of his injured arm, because he finds that two hands are better than one in guiding the material through the saw. The impulse to exercise is incidental to the general task in which he is engaged. Already there is noticeable improvement in his ability to use the crippled hand and arm. At the same time the quality of his task is improving and that means continued motivation. He is still enrolled in reading, writing and arithmetic. Thus the school serves a double function: supplementing the work of the physio-therapy department and at the same time supplying a distinct educational need."

## WORK CURES RESTLESSNESS

Camp Jackson reports the use of crafts as a diversion in serious cases of patient confined to bed in uncomfortable position with his feet higher than his head.

"His recovery depended upon his remaining in that position. He was restless and this restlessness threatened to undo all the doctor had done for him; it was only after he had been furnished with occupational and educational work that he was able to overcome his restlessness and remain in the required position for long periods."

## TOYMAKING IS ATTRACTIVE

Fort Sheridan reports the case of toy making as affording interest and creating enthusiasm.

"H. classed himself as the 'biggest bum in the ward' and took little interest in the occupational work. He was too interested in sleeping and crap shooting, but frequently the aides conversed with him, not mentioning the work. Slowly H. has voluntarily become interested in what the other men were doing to pass the time, and now the open shop hours are not long enough for this enthusiastic toy maker."

## DRAFTING IS INTERESTING

Camp Pike gives an illustration of the relief from monotony and homesickness which came from study of drafting.

F. N., "A case of empyema who studied drafting. This man had spent so many long dreary days in the ward that he was totally disgusted with life. The work made him forget himself and in a letter to a friend he says, 'I really enjoyed the last month I was in the hospital. I worked about all the time in the drafting-room, and this period was about the only time I wasn't homesick while I was in the army.'"

## TYPEWRITING IN TUBERCULOSIS

Private First Class H. J. G., at General Hospital No. 16, New Haven, Conn., tuberculous, had a slight knowledge of a typewriter keyboard, but no speed. He practiced under instruction one hour daily for two months.

"Private G. has earned the Remington gold medal for writing at the rate of fifty-five words net for ten consecutive minutes in a speed test given March 6, 1917. He has developed considerable ability in setting up letters."

## POULTRY RAISING FOR TUBERCULOUS PATIENT

Sergeant H. at Fort Bayard, New Mexico, tuberculous, was described as "the most despondent and dejected soldier that has been interviewed at this Post."

"He had just been told that he must 'chase the cure' all the time except one hour in which he could take school work. He declared for suicide unless

allowed to return home. He was a pharmacist and drug store manager at home. Finally after counsel and canvass of entire educational program they hit upon poultry raising. 'I already have \$500 invested in a poultry farm, paying good dividends. I believe I will learn something about that.' He was much interested, used every available minute. At next monthly examination after beginning this study he had gained ten pounds in weight and the physician gave him three hours for school work daily."

#### TELEGRAPHY

Private W. S., tuberculous, in the New Haven Hospital knew the Morse code at start. During two hours daily study for three months Private S. reached a speed in sending of twenty-eight words per minute and twenty-four in receiving.

"Being efficient as a telegraph operator, he acquired a knowledge of wiring and care of wet batteries, including charging, etc. He has been offered two positions as telegraph operator with the railroad."

#### TRAINED FOR FOREMAN

Camp Grant sends this account. Private M. C., Co. A, 131st Infantry, injured in France, November 10, his right hand and wrist practically useless, an Italian, unable to understand English and illiterate also in his native language, a laborer on a street paving and sewer concern before the war.

"He became interested in education through penmanship. In about six weeks he could write a very clear legible style with his left hand. He had learned to read and had a working knowledge of the fundamentals of arithmetic. He hopes to continue his studies until he is able to figure a job and be able to direct the work of others in the line of which he has practical knowledge. He has become a citizen of the United States and appreciates the advantages which are given to soldiers and citizens."











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